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Final Evaluation Factors

Phase 2, Stage 2A General Overview Analysis

Environmental Assessment of the Landfill Component of Halton's Solid Waste Management System

ERRATA.1

Final Evaluation Factors

Phase 2, Stage 2: General Overview Analysis

		Change
Pg. 24	Line 12	$4,500/ac. to $4,000/ac.
Pg. 60	Line 22	$4,500/ac. to $4,000/ac.
Table 2,	Economic Factors/Low	$4,500/ac. to $4,000/ac.
Appendix 1 Table-Level of Impact	Economic Factors /Low	$4,500/ac. to $4,000/ac.

PHASE 2, STAGE 2A
HALTON ENVIRONMENTAL ASSESSMENT
FINAL EVALUATION FACTORS

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INTRODUCTION

This report includes the final evaluation factors to be used in the General Overview Analysis stage in the site selection process for the landfill component. Section 1 deals with the site selection process for the General Overview Analysis and Section 2 deals with the final evaluation factors.

It should be emphasized that the evaluation factors to be used for the General Overview Analysis are primarily intended to screen out areas of the Region that would not be suitable for further consideration for landfilling. This is the first step in the site selection process and, therefore, the evaluation factors are relatively broad in scope and are not related to site-specific issues, such as design and operating costs of landfills, community profiles or characteristics, or site-specific characteristics of environmentally sensitive areas. These types of issues will be dealt with at the site comparison stage which will be undertaken in subsequent steps in the site selection process.

Responses to the submissions on particular site-specific issues are included in Section 3. The level of detail in the evaluation factors at the site comparison stage (2B) will reflect the fact that smaller, more defined areas and ultimately sites, will be identified and compared. Our first task, therefore, is to reduce the entire Region to areas which can be examined in greater detail and compared as to the area's suitability for landfilling.

We recognize that there are trade-offs required throughout each stage of the site selection process and we have attempted to rank the order of the trade-offs by assigning priorities to the four categories of evaluation factors. In the submissions received (See Section 3), there was no specific disagreement with the ranking of the priorities with the exception of fitting in Group B and D, social and cultural factors, as a second priority item, following physical factors. The inclusion of social and cultural factors as a priority item completes the ranking of all groups of factors for the General Overview Analysis. With respect to the draft evaluation factors, several changes were made to respond to suggestions in the submissions. The basis for these changes is included in our review of the submissions, Section 3. The proposed changes to the draft evaluation factors are included in Section 4.

Finally, the Appendices include a report on the Public Open House held July 20, 1983, and copies of the actual submissions received from external agencies and interest groups.

SECTION 1 - SITE SCREENING PROCESS

The process of identifying and evaluating potential areas for landfilling will be undertaken in three major steps, as identified in the Final Work Program for the Environmental Assessment, May, 1983.

The site selection stage is referred to generally as Stage 2 and the 3 steps within Stage 2 are referred to as sub-stages. The following sequence of sub-stages will occur in the screening process:

Stage 2A: General Overview Analysis
Stage 2B: Detailed Site Comparison
Stage 2C: Final Site(s) Evaluation

The information presented in this report is related to Stage 2A, General Overview Analysis.

The purpose of this report is to describe the screening process for the General Overview Analysis and to establish the evaluation factors to be used in the screening process for the General Overview Analysis. It should be noted that the specific process for site selection discussed in this report applies to the first screening level, which is the overview of the entire Region of Halton. Similarly, the final evaluation factors apply to the first step in the site selection process. More detailed evaluation factors will be established at each subsequent step leading up to the final selection of a landfill site or sites. The evaluation factors may be generally categorized as follows:

A. <u>Physical Factors</u>

- Soils/Geology
- Topography and Landforms
- Hydrology
- Hydrogeology
- Biophysical
- Land Use (including agriculture, recreation and other resource lands)
- Transportation

B. Social Factors

- Population Density
- Community Services (including recreation) and Institutions

C. Economic

- Haul Costs
- Land Costs

D. Cultural

- Historical
- Archaeological

In accordance with the Final Work Program, May 1983, the following activities will be undertaken in the General Overview Analysis:

- identify physical, social, economic and cultural factors to be used in review of potential landfill areas in Halton;
- identify acceptable levels of impact for each of the factors identified;
- establish what level of analysis would be appropriate to an initial screening of lands in Halton Region;
- circulate evaluation factors and revise, as necessary; and
- undertake screening process and identify potential areas for landfilling.

It should be noted that this stage will be based on common elements for the selection of potential landfilling areas, which do not change regardless of the preferred waste management system. In other words, the overview stage is intended to screen out areas that would be unsuitable for landfilling from a physical, economic, social and cultural standpoint.

Our assumption of the landfill component required at this stage is based on Regional Council's approval on June 22, 1983, of a maximum of 7.2 million cubic yards for landfill. It is also assumed that the volume of the landfill component may be reviewed by Council at each subsequent stage in the site selection process until completion of Phase 2, Stage 2 - Site Selection, and

that the 7.2 million cubic yards figure may increase if it appears, after investigation, that an EFW facility in Halton cannot accommodate the full volume assigned to it in generic review of the Systems Analysis.

The following amendment was approved by Council on June 22, 1983, with respect to the size of the landfill component (volume) required:

> "That item 2.6 of the Planning and Public Works Committee Meeting No. 20-83 be amended to add the following:
>
> 'PROVIDED THAT before completion of each stage of the Site Selection Procedure and again prior to the preparation of the Draft Environmental assessment document in Phase III, the Consultants and the Staff must review with Council the affects on the process of the size of the Landfill Component then being sought.'"

1.1 Final Evaluation Factors

The basis for the evaluation factors to be used in the General Overview Analysis is described in the work program for Stage 2 (Final Work Program, May 1983, Addendum 6).

The factors are intended to try to cover the broad definition of "environment" in the Environmental Assessment Act, as follows:

> "(c) 'environment' means,
>
> (i) air, land or water,
>
> (ii) plant and animal life, including man,
>
> (iii) the social, economic and cultural conditions that influence the life of man or a community,
>
> (iv) any building, structure, machine or other device or thing made by man,
>
> (v) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the activities of man, or

(vi) any part or combination of the foregoing and the inter-relationships between any two or more of them,

in or of Ontario".

While these elements of the environment are to be considered in the overall site screening process, we will try to deal with the elements of the environment at an appropriate level of detail for each step in the site screening process. At the first stage - General Overview Analysis, it is important to establish the following:

- approach to screen out areas in Halton Region that would be considered less desirable for landfilling;
- method for identifying areas of Halton Region that would be suitable for landfilling;
- consideration of environmental factors that, when applied in Halton, lead to candidate areas for landfilling;
- system of prioritizing the relative importance of environmental factors at the overview stage.

Each of the above points is dealt with as follows:

a) Suitable Areas for Landfilling

Due to the complexity and diversity of natural environmental conditions in Halton, such as major aquifers, significant ecological habitats, and prominant landforms, the potential impact on these natural environmental conditions could be substantial. Therefore, we propose to give the highest priority at this stage to avoiding such areas within the Region that could be adversely affected by landfilling activities. In order to fulfill the objective of avoiding areas that could be adversely affected by landfilling, certain factors will be given an "unacceptable" ranking which would mean that areas with specific physical, social or cultural characteristics would be identified as unacceptable and not given further consideration for landfilling at the overview stage.

The system of prioritizing implies some additional weight on physical factors in the initial site selection process, but the significance of physical factors will possibly be given a different priority rating compared to other factors in subsequent stages, such as the site comparison and final site(s) evaluation stages. For example, while the physical factors receive a higher priority rating at this scale of investigation, social factors will be considered at much greater detail in subsequent stages. Social, economic, and cultural factors will be evaluated at an appropriate level of detail for the General Overview Analysis.

b) Application of Final Evaluation Factors

Potential impacts of establishing landfill activities in an area(s) will be categorized as follows, for the final evaluation factors:

1. Unacceptable Impact
2. High Impact
3. Moderate Impact
4. Low Impact

The above impacts are essentially defined within the description of each of the final evaluation factors (see Section 2). The "unacceptable" impact category would be addressed initially to screen out areas of the Region that should not receive further consideration for landfill in the initial stage of the General Overview Analysis. The remaining areas would then be evaluated on the basis of "High", "Moderate" or "Low" impacts. With some factors, there will be a broader range of impact, such as "Low-Moderate" where an individual rating would be considered inappropriate.

The general application of the evaluation factors will be done using overlay mapping. Separate mapping will be prepared initially to illustrate the areas affected by the levels of impact "High", "Moderate" and "Low", for each evaluation factor, and then combined through a process of overlays to identify areas of least impact from the physical, social, economic, and cultural

perspective. The priorities shown below will be applied to rank the groups of factors at the overview stage and to act as a guide in trading off among the various factors. Possible mitigating measures at the overview stage will be considered in terms of the moderate-high impacts which may be remedied at a later stage. Mitigating measures will be considered in terms of the supplementary factors (see Section 2.A.5).

1.2 Priority Ranking of Evaluation Factors

To assist in establishing potential landfilling areas, the groups of evaluation factors will be prioritized in the following broad categories.

The first and second priority items are related to physical factors included in Section 2 under Group A. The third priority item covers those evaluation factors in Group B and D in Section 2. Finally, the fourth priority item covers the evaluation factors in Group C.

First Priority Item - Avoid disturbance or degredation of the natural environment, including landforms, natural habitats, major aquifers, preservation and conservation areas.

Second Priority Item - Maintain and preserve natural resource areas in Halton, where possible, such as agricultural lands, recreation areas, aggregate resource areas, and forestry areas.

Third Priority Item - Avoid community services and institutions of provincial, major regional or local cultural or social significance; and avoid areas of high population density.

Fourth Priority Item - Minimize the increase in costs to Halton residents for the provision of solid waste management services, including collection, distribution, and disposal.

1.3 Opportunities for Public Input

The following opportunities are being provided for public input during the General Overview Analysis:

- Public Open House on July 20, 1983, from 5:00 - 9:30 p.m. - Report on Draft Evaluation Factors (see Appendix I);
- Written submissions to Halton Region on Draft Evaluation Factors until July 22, 1983 (see Appendix II);
- Public Open House in September, 1983 - Public review of potential landfill areas;
- Written submissions to Halton Region on Draft General Overview Analysis.

SECTION 2: FINAL EVALUATION FACTORS FOR OVERVIEW ANALYSIS

The final evaluation factors are generally described as to their purpose at the overview stage; identification of the specific evaluation factor to be used; and a description of the levels of impact that will be applied for each draft evaluation factor. The final evaluation of the factors will also include the results of the analysis and, where applicable, a mapping reference.

The overview analysis for selection of potential landfill areas, proposed herein, varies from previous work in that it will consider the use of damaged lands (quarries), low agricultural capability lands and the engineerability of potential landfill areas. Other factors previously considered in earlier reports prepared on behalf of the Region will be updated with current available data.

A. PHYSICAL FACTORS

A.1 SOILS/QUATERNARY GEOLOGY

A.1.1 Attenuation Capability

The purpose of examining soil types in the General Overview Analysis is to identify and rank the attenuating capabilities of the various soil materials in Halton and thereby determine the degree of protection they afford groundwater and surface water resources. In general, the finer grained soils are better attenuators than the coarser grained soils and, therefore, the potential impact for groundwater contamination is lowest for silt and clay. The type, composition and sequence of underlying and adjacent soils or geologic materials influences the extent to which groundwater may be contaminated. The hydraulic conductivity of the geologic materials is of considerable importance as well as the types of openings (fractures or intergranular pores) through which the groundwater moves.

The specific evaluation factor is Attenuation Capability. It would be rated as follows:

Attenuation Capability	Impact
Glacial Outwash (sand and gravel deposits)	Moderate to high impact
Pleistocene Geologic complexes	Moderate impact
Till and clay plains	Low impact

A.1.2 Overburden Thickness

The thickness of overburden is also related to the degree of soil attenuation as this affects the migration of landfill contaminants in the subsurface.

The rating system considers the environmental effect of reducing overburden thickness by the removal of overburden for cover material.

The specific evaluation factor is Overburden Thickness. It would be rated as follows:

Overburden Thickness	Impact
0 - 5m	High potential impact
5 - 15m	Moderate potential impact
15+ m	Low potential impact

A.1.3 Agricultural Capability

The feasibility of using low agricultural capability lands for landfilling will be examined as an alternative to better agricultural areas that have been identified in previous site selection reports in Halton.

The specific evaluation factor is Agricultural Capability. It would be rated according to three levels of impact, which are inversely related to the potential for nonagricultural land use activities. In other words, a high rating for agricultural capability would denote a high impact on agriculture.

This ranking system would be used if it is determined that utilizing low grade agricultural lands is otherwise feasible.

Agricultural Capability	Impact
Class 1, 2, 3, 4	High impact on agriculture
Class 5, 6, 7	Low-Moderate impact on agriculture

A.2 TOPOGRAPHY AND LANDFORMS

A.2.1 Niagara Escarpment

Disposal at the slope face of the Niagara Escarpment will not be contemplated. The slope face will be considered to be that portion of the Escarpment where the slope exceeds 20 percent.

A.2.2 Slope

Terrain conditions suitable for landfill operations will be examined. Generally, slopes exceeding 20 percent are considered unsuitable for landfill because of the difficulty of operating equipment on such slopes.

The specific evaluation factor would be Slope. It would be rated as follows:

Slope	Impact
Greater than 20%	High impact
0 - 20%	Low - moderate impact

A.3 SURFACE WATER

A.3.1 Drainage

In the overview process, a buffer zone between the landfill and major surface water courses would be judged as desirable. The setback distance between a landfill and a major stream depends on the soil type, its attenuation capability and the assimilative capacity of the receiving stream.

It is proposed that a minimum setback distance of 100m be established to provide a buffer zone between a landfill and a major watercourse. Major watercourses are defined as those shown on the Regional Municipality of Halton Base Map.

The specific evaluation factor is Distance from Major Watercourse. It would be rated as follows:

Distance from Major Watercourse	Impact
Less than 100m	Unacceptable
More than 100m	Low - moderate

A.4 GROUNDWATER

A.4.1 Areas of High Infiltration

Areas of potential high groundwater recharge such as surficial sands and gravel and exposed or thinly covered dolostones will be identified. The importance of this factor is dependent upon site-specific hydrogeologic conditions but in the overview process avoidance of such areas if possible is considered desirable.

The specific evaluation factor is Infiltration. It would be rated as follows:

Infiltration	Impact
Infiltration greater than 25cm/year	Potentially high impact
Infiltration 15-25cm/year	Moderate impact
Infiltration less than 15cm/year	Low impact

A.4.2 Buried Valley - Aquifer Complexes

Buried pre-glacial valleys have been identified in some areas of Halton. They frequently contain sand and gravel deposits that form major aquifers, such as the Georgetown aquifer. While solid waste disposal in these areas might be contemplated with proper environmental controls, it is desirable to avoid these areas if possible, given that there may be other areas in the Region without this constraint.

The evaluation factor is Buried Valley - Aquifer Complexes. It would be rated simply as unacceptable where such areas are identified and would not be considered for landfilling.

A.4.3 Type and Distribution of Aquifers

Groundwater aquifers are characteristic of most areas in Ontario and are capable of supplying sufficient water, for domestic purposes at least. Consequently, some impact on local aquifers may occur wherever landfills are to be sited. Although impact on aquifers is reduced by natural attentuation and/or the collection and treatment of leachate, disposal on major municipal supply aquifers should be avoided if possible at this stage.

A.5 SUPPLEMENTARY FACTORS

A.5.1 Water Serviced Areas

We propose to identify areas that are presently serviced with municipal water or that may be serviced in the 20 year planning period. Landfilling located along or near a major water pipeline may be advantageous in that water supply restoration would be ensured in the event of adverse environmental effects. This factor is not considered to be a major overview constraint but may be useful in prioritizing areas selected by other methods.

A.5.2 Engineerability

Most landfill sites can be engineered to prevent significant environmental degradation. The cost and complexity of such engineering systems depends on many other factors such as stratigraphic complexity, hydrology, availability of buffer areas, feasibility of on-site treatment and control of leachate, and distance to treatment facilities if required. While engineerability is an important consideration in the selection of alternative potential sites, it is not a pure overview factor at this stage. Consequently, the engineerability factor will be considered as an additional factor after broad potential landfill areas have been selected by other means.

A.5.3 Landfilling in Quarries

Exposed rock areas may be considered generally unsuitable for solid waste disposal. The creation of new quarries in Halton specifically for solid waste disposal would also not be considered. However, there are existing unused quarries in Halton that will be examined as possible landfilling areas. Some advantages of using quarries for landfilling in Halton include rehabilitation of damaged land and avoidance of a potential conflict with the use of good agricultural land. The common disadvantage of using quarries for landfilling is that such

areas may require extensive engineering to control leachate. If sufficient overburden cover material is lacking locally, a landfilling operation may not be feasible.

Operating quarries would be judged undesirable for sanitary landfill. There are likely to be significant conflicts, particularly where the landfill operation is conducted by someone other than the owner/operator of the quarry. An active quarry that is extracting material, other than for cover, would have to be closely coordinated with the landfill process and its environmental control facilities.

Since the philosophy for siting a landfill in a quarry differs from the objective of natural attenuation, landfilling in quarries will be considered on a site-specific basis.

A.6 BIOPHYSICAL

A.6.1 Environmentally Sensitive Areas

At the initial screening level, the biophysical factor would involve identification of environmentally sensitive and/or significant areas. The Region has commissioned extensive work for the purpose of designating Environmentally Sensitive Areas (E.S.A.'s) in the Regional Official Plan. There have been 37 Environmentally Sensitive Areas identified, using nine criteria as the basis for selection of E.S.A.'s. Guidelines for the interpretation of each of the criteria have also been developed by the Region which are administered jointly by the Halton Planning and Development Department and the Halton Ecological and Environmental Advisory Committee. The criteria and guidelines for identification of E.S.A.'s in Halton appear to be well-argued and are currently applied in Halton for landfill sites.

All of the 37 E.S.A.'s identified by the Region will be examined, including other candidate areas for E.S.A.'s in Halton, identified by appropriate agencies and individuals.

The levels of impact are based on the Regional criteria used to establish the Environmentally Sensitive Areas, and given a weighting for the overview stage. Thus, "unacceptable" areas are those that have either

Criterion 2 or Criterion 6 (the latter signifies provincial or national status); "high" impact areas have one or more of Criteria 4, 5, 7, or 6 at the regional status level; moderate impact areas have one or more of any of the other criteria. The rating is only a guide for possible trade-offs at the site comparison level in areas near ESA's.

The factors will be used to classify sensitive areas and other significant areas identified by the Ministry of Natural Resources and Conservation Authorities.

Environmentally Sensitive and/or Significant Areas	Impact
The ecological function of the area contributes significantly to the maintenance of a natural system beyond its boundaries by serving as a water storage, recharge, or discharge area, important wildlife migratory stopover or concentration point, or a linkage of suitable habitat between natural biological communities; or The area provides habitat for rare or endangered species that are endangered Provincially or Nationally.	Unacceptable
The area is a habitat with limited representation in the Region, Ontario or Canada or a small remnant of particular habitats that have virtually disappeared within the Region; or	High

The area has an unusually high diversity of biological communities; or The area is large, affording a habitat for species requiring extensive blocks of suitable habitat; or The area provides habitat for rare or endangered species that are endangered Regionally; or Areas adjacent to areas identified above as being 'unacceptable'.	High (continued)
The area represents a distinctive and unusual landform within the Region, Ontario or Canada; or The plant and/or animal communities are identified as unusually high quality within the Region, Ontario or Canada; or The area is particularly suitable for scientific research and conservation education purposes; or The area has high aesthetic value in the context of the surrounding landscape) or, Areas adjacent to areas identified above as 'High' impact.	Moderate
Areas lying adjacent to areas identified above as 'Moderate' impact.	Low

A.7 LAND USE

The purpose of this land use evaluation factor at the initial screening level is to identify existing and proposed built-up areas, essentially "Urban Areas", "Hamlets" and "Rural Clusters" (as identified in the Regional Official Plan, The Regional Concept, Map 1 and in the Halton Region Rural Cluster Study, June 1982). These areas, as identified, embody the extent of planned areas of concentrated residential development within the Region over the long-term (balance of the 20th Century). Plans affecting land use prepared by Area Municipalities, the Province and other agencies will also be identified in order to maintain a consistent approach.

Agriculture, recreation and other resource lands will be identified in the evaluation of physical factors and/or in the review of the Regional Official Plan.

The specific evaluation factor is Compatibility with Existing and Planned Land Use. It would be evaluated as follows:

Compatibility with Existing and Planned Land Use	Impact
Within or adjacent to existing built-up areas and/or existing hamlets or rural clusters	Unacceptable
Within or adjacent to planned urban areas or planned rural clusters	High
Within 1.6 km of the designated areas, as above	Moderate
More than 1.6 km of the designated areas, as above	Low

It should be noted that Provincial, Regional, and local Plans affecting the siting of waste disposal facilities in Halton will be reviewed. Relevant policies from these Plans which affect the environmental factors to be used at the overview stage will be identified.

A.8 TRANSPORTATION

Potential transportation impacts related to establishing potential landfilling areas will be described under the factor Traffic Service & Safety. This factor will be used to indicate the general travel condition changes that are likely to occur on the Region's road network (existing and planned) as a result of landfill activities. The suitability of an area for landfilling with respect to transportation will be evaluated by the classification, condition and proximity of roads accessing the area.

Areas within the Region that are well serviced by provincial highways and primary and secondary arterials are considered generally more attractive for landfilling from a transportation standpoint. These highways and arterials are more appropriate locations for landfill-related traffic than local roads due to:

- operating conditions (travelling speed, geometry, conflicts with local traffic, etc.);
- nature of/control of adjacent land uses;
- traffic volumes.

The following 'area' conditions will be used to categorize potential transportation impacts:

A. The area is not adequately serviced for landfilling activities by provincial highways.

B. The area is not adequately serviced for landfilling activities by primary or secondary arterials.

C. Local terrain, road conditions and adjacent land use along local roads are not suitable for road upgrading to arterial standards.

D. Disruption of local traffic would result with the introduction of haulage vehicles on area roads.

E. Potential vehicle-pedestrian conflicts could exist.

The specific evaluation factor is Traffic Service and Safety. It would be rated as follows:

Traffic Service and Safety	Impact
A, B, C, D and E	Unacceptable
A, B, D & E or A, B, D	High
A	Moderate
None of the above	Low

B. SOCIAL FACTORS

B.1 POPULATION DENSITY

Population density for urban and rural areas will be identified within the context of Halton. The methods of determining appropriate population density levels will be based on a review of current provincial and regional statistical information for Halton communities. The evaluation factor will be applied using the four levels of impact and the principle of high urban population density will be directly related to the high impact level.

Therefore, areas of high urban population density will be generally avoided at the initial screening level due to the potential adverse effects of landfilling activities on heavily populated areas. The population density parameters to be employed are as follows:

Population Density	Impact
400 persons/square kilometre or greater	Unacceptable
200-399 persons/square kilometre	High
100-199 persons/square kilometre	Moderate
Less than 100 persons/square kilometre	Low

B.2 COMMUNITY SERVICES AND INSTITUTIONS

It is intended that, at the initial screening level, areas which include community facilities of Provincial and/or Regional status will be avoided. Such areas would be considered particularly sensitive to the potential impacts of landfilling activities. They will be identified from secondary material.

The following factors will be used to evaluate impacts on community services and institutions:

Community Service and Institutions	Impact
Locally unique, provincial and regional serving facilities including provincial parks, conservation areas, the Bruce Trail	Unacceptable
Major, regional serving facilities characterized by large, temporary populations and/or with special siting criteria including hospitals, correctional facilities, airfields, colleges, high schools	High
Regional and community serving facilities with generally lower temporary populations including elementary schools, homes for the aged, nursing homes, major community centres. Regionally significant social or cultural features including cemeteries, parkway belt, museums	Moderate
Facilities with lower temporary populations and/or seasonal populations including municipally designated open space, public and private recreation facilities including golf courses, race tracks, drive-ins	Low

Important scenic features which form part of the Region's cultural landscape will be incorporated where possible with the above description of social and cultural factors. The potential impacts of landfilling activities in such areas would be considered undesirable and, therefore, landfilling should be avoided.

C. ECONOMIC FACTORS

C.1 LAND COSTS

Anticipated per-acre purchase price will be evaluated at the overview stage. This indicator will be based on broad selling price averages for potential landfill areas.

The specific evaluation factor is Land Costs. It would be rated as follows in 1982 Dollars:

Land Costs	Impact
Above $50,000/ha. (approx. $20,000/acre)	High
$10,000-$50,000/ha (approx. $4,000-$20,000/acre)	Moderate
Below $10,000/ha (approx. $4,500/acre)	Low

C.2 HAUL COSTS

The purpose of this evaluation factor is to analyze and compare the cost of moving waste from generation areas to the potential areas of landfill within various Regional sectors.

The specific evaluation factor is Haul Costs. It would be rated as follows:

Haul Costs	Impact
$13.00-$19.00/tonne	High
$8.00-$13.00/tonne	Medium
$2.00-$8.00/tonne	Low

While potential site development and operation costs are relevant to the selection of a landfill site, these costs are highly site specific and cannot be used as factors at this stage of the analysis. Site development and operation costs will be used in the evaluation process at a subsequent stage when specific sites have been identified.

D. CULTURAL FACTORS

D.1 HISTORICAL

The purpose of the historical evaluation factor at the overview stage is to ensure that historical sites, properties and buildings are protected and left undisturbed wherever possible. Areas which include known historical sites of National, Provincial, Regional and local status will be identified. Potential historical site designations will also be identified from available existing information.

For the purpose of the overview analysis, Areas of Known and Potential Historical Sites is the specific evaluation factor. Such areas will be avoided at the initial screening level unless the area is considered suitable for landfilling from the evaluation of other factors. Therefore, the factor is not an absolute constraint at this level.

D.2 ARCHAEOLOGICAL RESOURCES

It is intended that locations of all registered and known archaeological sites in Halton will be identified. Archaeological information for this stage will be provided from a recent study prepared specifically for the Halton Environmental Assessment by the Museum of Indian Archaeology.

The presence of known archaeological sites within a potential area identified for landfilling will not be an absolute constraint. However, the presence of such sites will be documented and, at the next level of detail, further investigations of known archaeological sites would be undertaken to establish a more thorough understanding of site potential within the defined area(s).

SECTION 3 - ANALYSIS OF SUBMISSIONS ON DRAFT EVALUATION FACTORS

The Draft Evaluation Factors Report, Phase 2, Stage 2A: General Overview Analysis, July, 1983, was circulated to the study's mailing list in July 1983. Submissions were received from the following agencies and interest groups:

- Regional Municipality of Halton, Planning & Development Department (R. Mohammed)
- Regional Municipality of Halton: Public Works Department (G.N. Woodburn)
- Regional Municipality of Halton: Ecological and Environmental Advisory Committee (E.E.A.C.)
- Ministry of the Environment: Environmental Assessment Branch (P. Rennick)
- Ministry of the Environment: Environmental Approvals and Project Engineering Branch (P.S. Isles)
- The Niagara Escarpment Commission (C.A. Louis)
- The Tremaine-Britannia Citizens Group (A. Katz)

Appendix II includes each of the above submissions. While Sections 1 and 2 of this report incorporate several of the comments received from various submissions, it is our intention to provide a review of the range of comments received and the reasons for maintaining or amending the draft evaluation factors. Section 4 describes the proposed changes to the draft evaluation factors.

The following sections provide an analysis of the submissions received from all respondents, in the same order of the Draft Evaluation Factors report. The first section deals with comments on the site selection process for the General Overview Analysis. Subsequent sections deal with the draft evaluation factors.

3.1 Site Selection Process

Submissions on the site selection process for the General Overview Analysis were received from the following sources:

- Environmental Approvals and Project Engineering Branch, Ministry of the Environment (P. Isles)
- Halton Ecological and Environmental Advisory Committee
- Planning and Development Department, Regional Municipality of Halton (R. Mohammed)
- Public Works Department, Regional Municipality of Halton (G. Woodburn)

Summary

The submissions received above were primarily requests for clarification of the site selection process at the General Overview Analysis stage and more particularly, the following concerns:

- the method to be used for weighing and ranking the factors;
- the relationship of priority items to the evaluation factors;
- the role of "unacceptable" rankings;
- clarification of the overlay mapping technique.

A specific suggestion was received for an alternative methodology to the site selection process in the General Overview Analysis, namely, that the Kepner-Tregoe approach be adopted. The Kepner-Tregoe model involves a series of seven procedures in a formalized decision-making process.[1] The procedures generally involve the evaluation of alternatives and how they perform against absolute and preferred objectives. Alternatives that do not meet the absolute objectives are discarded. Alternatives that meet the latter objectives are

[1]Charles H. Kepner, and Benjamin B. Tregoe, "The New Rational Manager", 1981.

evaluated against the preferred objectives. With weighted scores, each alternative receives a numerical weighting, with the highest score being the best alternative.

The assumptions of the Kepner-Tregoe model of decision-making assumes the following:

- that "MUST" and "WANT" objectives can be established clearly;
- that all objectives can be assigned a definitive numerical rating (i.e. absolutes); and
- that alternatives that do not meet the basic "MUST" objectives will be discarded.

The problems we foresee in applying the Kepner/Tregoe approach to the General Overview Analysis stage are as follows:

. the model provides a highly structured, numerical approach to ranking alternatives, which at this broad stage in the site selection process, does not meet the requirement for flexibility in the process;

. the "GO/NO GO" basis of discarding alternatives does not account for possible mitigating measures or means of modifying the alternative to create a more acceptable alternative;

. the methodology does not recognize various levels of evaluating alternatives so that a "low" level may be acceptable as an alternative, whereas a "high" level of impact may be less desirable.

These are significant concerns, in our view, which should be addressed in the site selection process for landfilling and, indeed, in the environmental assessment approach.

The modifications which would be required to adapt the Kepner-Tregoe model for the landfilling site selection process for the General Overview Analysis in Halton would, in our view, be so significant as to alter the basic approach of the Kepner-Tregoe philosophy.

We have taken the original suggestion into serious consideration to the extent that we have discussed the possible application of the Kepner-Tregoe methodology with a Ms. Jill Platt, who teaches the Kepner-Tregoe approach for the Province. It is our understanding that the method would not be applicable to the General Overview Analysis where there are no alternatives being considered.[2] However, the suggested approach could be considered at the site comparison stage, where alternatives would be established and compared.

Comments on the proposed method of weighing and ranking the evaluation factors have been clarified in the revised text of the final evaluation factors.

The relationship of the evaluation factors to the priority ranking will be made more explicit with the inclusion of social and cultural factors as a third priority item. Consequently, the first and second priority items remain as physical factors and the economic factors become the fourth priority item in the final version.

The factors in the "unacceptable" category have been reduced significantly, on the basis of submissions received. We recognize that the standards established in the Draft Evaluation Factors Report, July 1983, for the unacceptable category may have, in some cases, been too confining and restrictive for the General Overview Analysis, where some flexibility must be maintained for a "circle back" process should areas of consistent low impact be impossible to identify. It must also be recognized that even the factors which are to be rated "unacceptable" in the final evaluation factors, may be reviewed at subsequent steps in the General Overview Analysis before the final candidate areas are identified.

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[2]Telephone conversation with Ms. J. Platt, August 8, 1983.

With respect to the mapping of social and cultural factors, both population density and community services and institutions will be mapped. Gradients of population density within the low, moderate, high and unacceptable impact categories will be developed. The location and, where possible, the areal extent of significant social features will be mapped. It is our intention to include descriptions of the evaluation factors and the mapping technique applied to each factor.

The supplementary factors are intended to refine the number of identified candidate areas for landfill. The supplementary factors would be used if it is necessary to select areas within the broad potential areas or if the supplementary factors would act as mitigating measures in some of the areas to lessen the impact, for example, an engineering solution, or areas serviced by municipal water or expected to be serviced in the 20 year planning period.

3.2 Physical Factors

A.1 SOILS/QUATERNARY GEOLOGY

A.1.1 Attenuation Capability (formerly Soil Type)

Submissions were received from:

- Region of Halton, Public Works Department
- Halton Ecological and Environmental Advisory Committee
- The Tremaine-Britannia Citizens' Group

Summary: The following concerns were raised in the above submissions:

- the role of Quaternary Geology in the physical factors
- the title of the sub-heading in the draft evaluation factors should be consistent with the factor's description
- the physical factors assume that attenuation capability of till and clay plains is of prime importance

Analysis: Glacial activity throughout the Quaternary period has modified the physical makeup of the overburden in the Region. Consequently, interpretation of geologic processes throughout the Quaternary period helps define current hydrogeologic environments.

We agree that the first sub-heading should relate to the soil's attenuation capability and revisions have been made accordingly in the final evaluation factors. There is the possible inference that the geologically complex areas would suffer only moderate impact. This is not necessarily so depending on site-specific conditions. For example, the impact could actually vary from high to low depending upon site specific conditions. We recognize the possible

differences in assessing areas of "moderate" impact during the overview stage and thus have described these areas in a separate category from low and high impact areas.

With respect to physical factors and particularly attenuation capability, it is our objective to identify broad areas that provide good natural soil attenuation opportunities in the Region. Current Ministry of the Environment policy rejects landfill sites which depend upon extensive engineering as a first line of defence against pollution, where that system has to be backed up by another engineered contingency system. Even areas of good natural attenuation may require a backup leachate collection system at the design stage if such areas are selected in the overview analysis.

In addition, it is important to assess the feasibility of using low capability agricultural lands for landfilling and we have incorporated this aspect into the site selection process. The suitability of using quarries is to be considered. Since the philosophy for siting a landfill in a quarry differs from the primary objective of natural attenuation (i.e., a much higher degree of engineering is required), quarries must be evaluated on a site-specific basis.

The above response also applies to A.5.2, Engineerability, and A.5.3, Landfilling in Quarries.

A.1.2 Overburden Thickness

Submissions were received from:

. Regional Municipality of Halton, Public Works Department
. Halton Ecological and Environmental Advisory Committee

Summary: The following concerns were raised by the respondents:

. that it should be noted that overburden is removed to make room for refuse as well as providing cover material

. the impact of this factor must be weighed in combination with attenuation capability to establish a ranking

. the nature of engineering controls required on thin overburden sites

Analysis: In the overview process, overburden thickness is considered in association with soil attenuation capability as well as other factors. For example, an area with overburden thickness greater than 15m (low potential impact) would not be considered an optimal site, if the overburden in that area is predominantly sand and gravel.

The "unacceptable" impact rating will be deleted as we recognize the difficulty in interpretation and explanation of the "unacceptable" (without engineering) factor. We agree that a certain degree of engineering may be required on any landfill site to overcome site-specific conditions.

The revised factor rating will be as follows:

Overburden Thickness	Impact
0 - 5m	High potential impact
5 - 15m	Moderate potential impact
15+m	Low potential impact

A.1.3 Agricultural Lands

Submissions were received from:

- Region of Halton, Planning & Development Department
- Ministry of the Environment, Environmental Assessment Branch
- Ministry of the Environment, Environmental Approvals & Project Engineering Branch
- Niagara Escarpment Commission

Summary: The concerns raised by the respondents were as follows:

- evaluation of agricultural impact should take into account impact on farm communities
- the interpretation of agricultural soils classes derived from the Canada Land Inventory of Soil Capability for Agriculture in classifying levels of impact
- lands supporting specialty crops should also be rated as "high" impact
- explanation of the impact evaluation for agricultural lands should be provided

Analysis: It is true that agricultural impact is more than just soil capability. However, it would be beyond the scope and purpose of the overview analysis at the regional level to consider factors which are, in our view, better suited to a site-specific level of detail.

Our objective in considering agricultural capability as an evaluation factor in the General Overview Analysis is to determine the feasibility of using low agricultural capability lands for landfilling. For the overview analysis, we have to assume that agricultural capability relates to current and potential use of agricultural lands.

In accordance with the Region's comments regarding the classification of Agricultural Capability, we have changed the rating system for Agricultural Capability so that Class 4 lands are included within the "high" impact category. This classification system now corresponds with the Regional Plan definition. Classes 5, 6 and 7 are now rated in "low-moderate" impact category.

A.2 TOPOGRAPHY AND LANDFORMS

A.2.1 Niagara Escarpment

Submissions were received from:

- Region of Halton, Public Works Department
- Niagara Escarpment Commission

Summary: The concerns raised by the respondents are as follows: -

- clarification is required as to the meaning of the 'slope face' of the Niagara Escarpment
- that the Escarpment Natural and Protection Area designations of the Final Proposed Plan for the Niagara Escarpment should be used in dealing with the Escarpment

Analysis: The slope face refers to that portion of the Escarpment where the slope exceeds 20%.

The Escarpment Natural and Protection Area designations will be used in the site comparison stage, once candidate areas have been identified. At the overview stage, we will be dealing with the policies in the Final Proposed Plan pertaining to those areas.

A.2.2 Slope

Submissions were received from:

. Region of Halton, Public Works Department
. Halton Ecological and Environmental Advisory Committee

Summary: The concerns raised by the respondents were as follows:

. that landfilling can be done on slopes steeper than 20%
. that a range of impacts should be presented, reflecting severity of slope

Analysis: Terrain with long slopes greater than 20% will be difficult to prepare for landfilling. Excavations with side slopes greater than 20% are certainly feasible and finished slopes up to about 25% are common practice. The working limit for most earth moving (track) equipment is about 33%. This does not preclude the possibility of starting an excavation that cuts into a steep slope or from constructing a fill adjacent a slope steeper than 20%.

A range of impacts relating to various slope categories cannot be easily discerned. The impact is suffered by the landfill operation, not by the environment. Nonetheless, the slope factor rating should be amended as follows:

Slope	Impact
Greater than 20%	High impact
0 - 20%	Low to moderate impact

A.3 SURFACE WATER

A.3.1 Drainage

Submissions were received from:

- Region of Halton, Public Works Department
- Halton Ecological and Environmental Advisory Committee

Summary: The concerns raised by the respondents were as follows:

- a definition for a major watercourse is requested
- the 100m setback from a major watercourse is too restrictive
- for distances over 100m, site characteristics should be taken into account rather than distance only

Analysis: Major watercourses have been identified as those shown on the Regional Municipality of Halton Base Map.

Areas closer than 100m to major surface water courses are judged to be unacceptable for landfilling and are to be screened out from further consideration at the overview process. This approach, however, does not preclude modifications to the setback distance at the site comparison stage and would depend on site-specific conditions. The 100m setback is used as a general guideline to screen out areas that should receive protection from potential impacts of a landfill.

A.3.2 Wetlands/Floodplains

Submissions were received from:

- Regional Municipality of Halton, Planning & Development Department
- Ecological and Environmental Advisory Committee

Summary: The concerns raised by the respondents are as follows:

- the validity of floodplains in the analysis is questioned and suggestion is that the factor be deleted
- the significance of the 50-hectare cut-off point as used in the draft evaluation factors is questioned

Analysis: The rating for floodplains will be deleted as there is potential for overlap with the setback of 100m from major watercourses. Floodplains would be more easily identified at the site comparison stage where mapping at an appropriate scale can be utilized.

Since a comprehensive wetland classification has not been carried out for all the watersheds involved, the significance of individual wetlands cannot be assessed. Since we did not want to eliminate wetlands from consideration, a category based on size is used. However, as an alternative, a better approach may be to eliminate the wetland factor and rely on the environmentally sensitive area factor to identify major wetland areas. Many important wetland complexes are components of the ESA's and their significance is defined.

A.4 GROUNDWATER

A.4.1 Areas of High Infiltration

Submissions were received from:

- Regional Municipality of Halton, Planning & Development Department
- Regional Municipality of Halton, Public Works Department

Summary: The concerns raised by the respondents were as follows:

- there may be a danger of double-counting the infiltration factor along with the attenuation factor
- a definition of the infiltration figures used in the report is requested

Analysis: The infiltration factor considers surficial geology and association with bedrock type; consequently, the infiltration map is similar to but not the same as the soil attenuation map. Double-counting will not occur because, in the overview analysis, factors are not numerically weighted.

Infiltration is the entry into the soil of water made available at ground surface. As recommended, infiltration should be stated as a quantity of water infiltrating the soil in a given period of time, i.e., centimetres per year.

A.4.2 Buried Valley-Aquifer Complexes

Submissions were received from:

- Regional Municipality of Halton, Planning & Development Department
- Ministry of the Environment, Environmental Approvals and Project Engineering Branch

Summary: The concerns raised by the respondents were as follows:

- impact with respect to aquifers should be ranked in the same way as other factors
- information is requested concerning the rating of a disposal site which would leach into a major aquifer

Analysis: Our analysis identifies only major supply aquifers. Significant costs would be required to mitigate severe aquifer degradation should these become contaminated. Therefore, the ranking is "unacceptable". Alternatively, we could rank impact relative to the yield potential of aquifers, which have been mapped roughly as to their capability to supply quality water to wells.

A.5 SUPPLEMENTARY FACTORS

A.5.1 General

A submission was received from:

- Regional Municipality of Halton, Planning & Development Department

Summary: The respondent requested the following information:

- the role of the supplementary factors in the General Overview Analysis

Analysis: Supplementary factors are to be considered once candidate landfill areas are identified. These factors are intended to refine the identified candidate areas. Furthermore, landfilling in quarries cannot be treated in the overlay analysis since their siting philosophy presents a "special case" situation.

A.5.2 Engineerability

A submission was received from:

. Ministry of the Environment, Environmental Assessment Branch

Summary: The respondents asked:

. whether sewer service areas should not also be included as a supplementary factor

Analysis: Distance to treatment facilities, etc., has been considered in the supplementary Engineerability Factor.

A.5.3 Landfilling in Quarries

A submission was received from:

. Region of Halton, Public Works Department

Summary: The concerns raised by the respondent were as follows:

. clarification of the statement that operating quarries would be judged unsuitable for landfill

. pervious studies did in fact consider low agricultural capability lands

. clarification of the use of the words 'explicit terms' in describing the approach to damaged lands

Analysis: Some years ago, Hydrology Consultants did extensive work in connection with a scheme to fill quarries with garbage "rail hauled" from Metro Toronto. That study disclosed several problems associated with sanitary landfill in active quarries. There are likely to be significant conflicts, particularly where the landfill operation is conducted separate from the quarry operation by someone other than the owner/operator of the quarry.

An active quarry that is extracting material, other than for cover, would have to be closely coordinated with the landfill process and its environmental control facilities. The word 'unsuitable' as used in the Draft Evaluation Factors has now been changed to 'undesirable'.

It is intended that the thrust of our work will be to thoroughly explore the feasibility of using damaged, or low agricultural

potential lands as opposed to using good agricultural lands. The overview would identify such areas so they may be considered in more detail, during the site comparison stage. We believe that the consideration of low agricultural capability lands is being dealt with in more explicit terms than in previous studies, in that it is to be incorporated as an evaluation factor in the site selection process.

A.6 BIOPHYSICAL

A.6.1 Environmentally Sensitive Areas

Submissions were received from the following:

- Regional Municipality of Halton, Planning & Development Department
- Halton Ecological and Environmental Advisory Committee
- Ministry of the Environment, Environmental Assessment Branch
- The Niagara Escarpment Commission

Summary: The concerns raised by the respondents were as follows:

- because of a modification to the Regional Plan, there are now 37 designated Environmentally Sensitive Areas
- the Regional selection criteria for ESA's are not appropriate for ranking purposes
- all ESA's are of at least Regional importance and are thus worthy of protection
- individual Environmental Impact Assessments would be required to determine impact with respect to each ESA
- a revision to the criteria to be applied to ESA's and adjacent areas is suggested
- Areas of Natural and Scientific Interest as identified by the Ministry of Natural Resources should also be included

Analysis: The General Overview Analysis will include the 37 designated ESA's, Areas of Natural and Scientific Interest, and other sensitive areas identified by Conservation Authorities and the Ministry of Natural Resources. All of these areas will be evaluated on the same basis--that is, on the ranking of selection criteria as used in the initial selection of the ESA's. It has been found that 35 of the

37 ESA's would be ranked as 'unacceptable'; nevertheless, it is considered that a ranking system is required to determine the order of magnitude of likely impact at this stage.

It would not be appropriate to undertake individual Environmental Impact Analysis with respect to each ESA, prior to the selection of sites. The level of analysis to be employed for the General Overview Analysis is intended only to define broad areas with potential for landfill. If it is found that there is potential for impact on one or more ESA's, this will be examined more closely in the detailed site comparison. A decision to proceed with an undertaking will be fully supported by the Environmental Assessment of the landfill component, and an approval under this process is recognized by the Region as falling within its requirements for Environmental Impact Assessments (EIA).

The ranking for areas lying adjacent to ESA's has been modified in accordance with the suggestion by the Ministry of the Environment as follows:

Areas lying adjacent to 'Unacceptable impact ESA's:	High impact
Areas lying adjacent to 'High' impact ESA's:	Moderate impact
Areas lying adjacent to 'Moderate impact ESA's:	Low impact

A.7 LAND USE

Submissions were received from the following:

- Regional Municipality of Halton, Planning & Development Department
- Regional Municipality of Halton, Public Works Department
- Ministry of the Environment, Environmental Assessment Branch
- The Niagara Escarpment Commission
- The Tremaine-Britannia Citizens Group

Summary: The issues raised in these submissions included the following:

- the factor should include Rural Clusters as identified in proposed Regional Plan Amendment No. 5, and possibly additional extensive areas of strip development
- landfills can be satisfactorily operated in urban areas, and have the advantage of proximity to sewage treatment facilities which enable leachate to be drained from the site and treated
- a perceived 'bias' in the evaluation factors against the location of landfills in urban areas
- the potential to locate a site close to an Energy from Waste plant with a nearby market and the potential to eliminate urban 'eyesores' has been ignored
- the section on land use factors should also refer to plans prepared by the Province and other agencies which affect the siting of landfills
- the Escarpment Natural and Protection Area designations in the Final Proposed Plan for the Niagara Escarpment should be used when dealing with the Escarpment

Analysis: The suggestion to include Rural Clusters in the land use evaluation factor will be incorporated. We agree that the addition of other areas of strip development would create a risk of double-counting with the population density factor, and have decided not to use this as part of the land use factor. We will, however, take areas of existing strip development into consideration when deciding on the final candidate areas and their boundaries.

Sanitary landfills have a number of characteristics which render them incompatible with built-up urban areas, including the possible generation of noise, odour, vermin, wind blown debris and the frequent passage through such areas of heavy vehicles. Therefore, the "unacceptable" impact category will be revised to reflect only existing built-up urban areas and existing Hamlets or Rural Clusters. To recognize the potential for longer term changes in land use and the anticipated growth of urban areas in the Region, we will maintain a "high" impact rating for planned urban areas, and planned Rural Clusters. Landfilling within or adjacent to these planned areas would be considered a high impact from the perspective of potential land use conflicts.

Documents found to be relevant to the planning of land use will be reviewed, although some of these mentioned also have relevance for other factors in the General Overview Analysis. We agree with the consideration of the Ontario Waste Management Corporation plans, and will review each subsequent stage in the OWMC process.

The Escarpment Natural and Protection Area designations of the Final Proposed Plan for the Niagara Escarpment will be considered at the site comparison stage. Policies relating to these areas will be considered in the review of the Final Proposed Plan.

A.8 TRANSPORTATION

A submission concerning this factor was received from:

. Regional Municipality of Halton, Public Works Department

Summary: . The exclusive use of existing roads and highways in the identification of areas unacceptable for landfill purposes was questioned. It was proposed that a municipality could build a new road to gain access to a landfill site(s).

Analysis: The overview analysis with respect to transportation will consider existing and currently proposed future roads and highways. This approach is considered as an adequate base to determine an area's potential for traffic impacts at the overview level. Once alternative landfill sites have been identified, more specific alternative transportation impacts and mitigation measures (such as the provision of new access roads) will be considered.

3.3 SOCIAL FACTORS

B.1 POPULATION DENSITY

Submissions concerning this factor were received from:

- Regional Municipality of Halton, Planning & Development Department
- Halton Ecological and Environmental Advisory Committee

Summary: The points raised in the submissions were as follows:

- the overlay mapping technique would be difficult to apply to the mapping of social or cultural constraints
- it should be made clear that sites selected will avoid developed residential areas and a specified 'cordon sanitaire' around these areas

Analysis: Population density and social features mapping will identify areas of high population density and significant social features. At this stage, mapping for population density patterns for the entire Region of Halton is being undertaken. Gradients of population density within the low, moderate, high and unacceptable impact categories as provided in the final evaluation factors report will be developed. The location and, where possible, the areal extent of significant social features will be mapped (also applicable to Factor B.2, Community Services and Institutions).

The factors with respect to built-up urban areas incorporate the concerns expressed in developed residential areas (Factor A.7, Land Use).

B.2 COMMUNITY SERVICES AND INSTITUTIONS

Submissions concerning this factor were received from:

- Regional Municipality of Halton, Planning & Development Department
- Regional Municipality of Halton, Public Works Department

The submission from the Planning and Development Department is dealt with under Factor B.1, Population Density.

Summary: The point raised by the Public Works Department is as follows:

- the basis for defining or determining an important scenic feature is questioned, as this would tend to be a matter of subjective judgement.
- there appears to be a conflict between the statement that important scenic features are to be avoided and the classification of aesthetic features as only a "moderate" impact under the Environmentally Sensitive Area (ESA) Factor A.6.1.

Analysis: It is our intention to incorporate the definition of important scenic features in the social factor on Community Services and Institutions at the overview stage. There is an overlap in the description of the weightings in that factor with scenic features. For example, features such as the provincial parks, the Bruce Trail, local public and private recreation areas, and Conservation Areas generally contain elements of important scenic features. However, at the site comparison stage, it may be necessary to establish a more detailed evaluation factor for scenic features depending on site-specific conditions.

The aesthetic feature classification is inherent to the selection criteria for ESA's, and will be considered in the evaluation of

ESA's. However, there may be other areas not classified within an ESA which have scenic features which should be recognized. Examples of such areas are included in the paragraph above. Therefore, we do not perceive a contradiction in the evaluation factors at the overview stage.

3.4 ECONOMIC FACTORS

C.1 LAND COSTS

and

C.2 HAUL COSTS

Submissions concerning both these factors were received from:

- Regional Municipality of Halton, Planning & Development Department
- Regional Municipality of Halton, Public Works Department
- Halton Ecological and Environmental Advisory Committee
- Ministry of the Environment, Environmental Approvals and Project Engineering Branch

Summary: The points raised in these submissions were as follows:

- the land cost factor is closely related to distance to urban areas and transportation considerations so that there is a risk of overlap with other factors
- clarification is requested concerning 'unacceptable' impacts for haul costs and land costs
- the text in the report should be self-explanatory, and not refer to other documents
- potential site development and operating costs for landfill should be considered as well as land costs and haul costs
- haul costs are more site-specific than general, and may vary according to location within a particular area
- it is suggested that land costs and haul costs should be integrated for the purpose of the analysis

Analysis: Land costs are related to distance from urban areas but only tenuously to the transportation considerations as they are defined at the overview stage. (The transportation factor concentrates on traffic service and safety.) The land cost factor will illustrate a different type of impact than the land use one which concentrates on proximity to urban areas. The land cost factor recognizes variations in the rural areas as well as the rural and urban differences. It will also serve to illustrate the dichotomy between haul costs and land costs (i.e. paying a higher land price may result in lower haul costs over the long term). We believe that the land cost factor is sufficiently independent to be retained in the overview analysis.

Comments with respect to the difficulty in understanding the "unacceptable" impact category and confusion caused by the references to the Phase 2, Stage 1 report for the haul costs are accepted. They were recognized prior to the Public Open House held on July 20, 1983, and changes to the descriptions for the land and haul costs have been made, which are reflected in the final evaluation factors.

The "unacceptable" category will not be employed in the evaluation of land and haul costs since its level is very difficult to define and in our view may not even apply. The economic factors, of themselves, would not rule out candidate areas at this stage, other than in the case of prime development sites.

For the haul cost factor, the "high, "moderate" and "low" impacts were changed to reflect the range of actual haul cost figures shown on pages 142 to 145 of the Phase 2, Stage 1 Report. (Note that they have been changed to (metric) tonnes.)

At the overview stage, no specific potential landfill sites have been defined, only receiver areas or zones. It is therefore impossible to use potential site development and operation costs as

factors at this stage of the analysis. The zones are of sufficient size that there could be considerable variation of such costs within them depending on site-specific conditions. Site development and site operation costs will be used in the evaluation process at the site comparison stage.

In the haul cost analysis, a series of waste generation zones are to be employed and potential receiver zones and the cost per tonne minute range identified in the Phase 2, Stage 1 report (9¢ to 11¢). The majority of the haul costs in most cases will result from the trip between the municipal waste centroid and the boundaries of the receiver zone which would not vary significantly regardless of where the site(s) would be located within the zone. The disposal time is also a constant factor. In addition, the largest of the receiver zones is approximately 6 miles square; the variation from the centroid would not be significant in terms of travel time. Therefore, we do consider that haul costs are an appropriate factor to use in the evaluation process at this stage.

It is acknowledged that haul costs and land costs are interrelated. While it is difficult to integrate them at this stage because a comprehensive cost analysis (including operating and site development costs) is impossible due to the absence of specific sites, we will attempt to integrate the two wherever possible.

The purpose of the "General Overview Analysis" as set out on page 4 of the document uses the terms "environmental factors" in two of the three objectives. The Environment Assessment Act employs a broad definition of the term "environment" to include". . . economic . . . conditions that influence the life of man or a community" (page 4). As such economic factors are being considered in the process leading to candidate areas for landfilling in Halton. Haul cost averages can be usefully examined on a zonal basis, while too many variables and unknows exist outside of a site-specific analysis to permit the consideration of site operating costs.

SECTION 4: SUMMARY OF CHANGES TO EVALUATION FACTORS

As a result of the formal review process, the Draft Evaluation Factors Report, June 1983, has been revised, and the General Overview Analysis will now be undertaken on the basis of the final factors contained in Section 2 of this report.

A summary of the changes to the draft evaluation factors discussed in the previous sections is shown in Table 1, below.

TABLE 1: SUMMARY OF CHANGES TO DRAFT EVALUATION FACTORS

Evaluation Factor	Category	Nature of Change
Overburden Thickness	A.1.2	- "unacceptable without engineering" category deleted - "high potential impact" category changed from 5-10 metres to 0-5 metres - "moderate potential impact" category changed from 10-15 metres to 5-15 metres - "low potential impact" category remains unchanged
Agricultural Capability	A.1.3	- 'high impact on agriculture' category changed from Class 1, 2, 3 to Class 1, 2, 3, 4 - 'moderate' (Class 4, 5) and 'low' (Class 6, 7) impact on agriculture categories changed to include Class 5, 6 and 7 as 'low-moderate impact on agriculture'.
Slope	A.2.2	- 'unacceptable impact' for slopes greater than 20% has been changed to 'high impact' - the 'low-moderate impact' category remains the same at 0-20%

TABLE 1: SUMMARY OF CHANGES TO DRAFT EVALUATION FACTORS (continued)

Evaluation Factor	Category	Nature of Change
Wetlands/Floodplains	A.3.2	- deleted entirely - wetlands of major significance to be covered in Environmentally Sensitive Areas - floodplains given protection at the overview stage by the 100m setback from major watercourses
Areas of High Infiltration	A.4.1	- factors remain the same, but parameters are now expressed in terms of centimetres per year
Environmentally Sensitive Areas	A.6.1	- areas adjacent to ESA's rated 'unacceptable' changed from 'low' to 'high' rating - areas adjacent to ESA's rated 'high' changed from 'low' to 'moderate' rating
Land Use	A.7.1	- 'Within designated Urban Areas and/or Development Areas at the local level; and Hamlets' changed to 'Within or adjacent to existing built-up Urban Areas and/or existing Hamlets or Rural Clusters in the 'Unacceptable' impact category - 'Adjacent to designated Urban Areas or Development Areas at the local level; and Hamlets' changed to 'Within or adjacent to planned Urban Areas and planned Rural Clusters' in the 'High' impact category - the 'Moderate' and 'Low' impact categories retain the 1.6 km (1 mile) break point, but now refer to the new 'Unacceptable' and 'High' impact categories as above.

TABLE 1: SUMMARY OF CHANGES TO DRAFT EVALUATION FACTORS (continued)

Evaluation Factor	Category	Nature of Change
Population Density	B.1	- no explicit factors were provided in the Draft Evaluaton Factors document - new factors as indicated in Section 2 and Table 2
Community Services & Institutions	B.2	- no specific factors were presented in the 'Draft Evaluation Factors' report - new factors as indicated in Section 2 and Table 2
Land Costs	C.1	- 'unacceptable' category and conditions ('not applicable to this factor as it must be considered as a potential trade-off with haul cost factor') now deleted - reference was formerly made to Stage 1 report for cost ranges in each category - cost ranges now specified in 1982 dollars as follows: "High: above $50,000/ha (app. $20,000/ac) "Moderate: $10,000-$50,000/ha (app. $4,000-$20,000/acre) "Low: below $10,000/ha (app. $4,500/acre) impact category
Haul Costs	C.2	- 'unacceptable category and conditions ('not applicable to this factor as it must be considered a potential trade-off with land costs') now deleted - reference was formerly made to Stage 1 Report for cost ranges in each category - cost ranges now specified in 1982 dollars as follows: High: $13.00-$19.00/tonne Moderate: $8.00-$13.00/tonne Low: $2.00-$8.00/tonne

At the Public Open House held on July 20, 1983, displays were presented to the public including a table showing the draft evalation factors. This table has now been revised to show the final evaluation factors, as described in Section 2 of this report. Table 2 is shown overleaf.

TABLE 2 - FINAL EVALUATION FACTORS FOR THE GENERAL OVERVIEW ANALYSIS

FACTORS	LEVELS OF IMPACT			
	Unacceptable	High	Moderate	Low
PHYSICAL FACTORS				
Attenuation Capability		Glacial Outwash (sand and gravel)	Pleistocene Geologic Complexes	Till and Clay Plains
Overburden Thickness		0-5 metres	5-15 metres	15+ metres
Agricultural Capability		Class 1, 2, 3, 4	Class 5,6, 7	
Slope		Greater than 20%	0 - 20%	
Distance from Major Watercourse	Less than 100 metres		More than 100 metres	
Infiltration		Greater than 25 centimetres per year	15-25 centimetres per year	Less than 15 centimetres per year
Buried Valley- Aquifer Complexes	Buried valley-Aquifer Complexes			
BIOPHYSICAL FACTORS				
Environmentally Sensitive Areas	- ecological function of area contributes significantly to maintenance of natural system beyond its boundaries by serving as a water storage, recharge or discharge area; or - habitat for Provincial or National rare or endangered species	- habitat with limited representation in the Region, Ontario or Canada or a small remnant of particular habitats that have virtually disappeared within the Region; or - area has an unusually high diversity of biological communities; or - large areas affording habitats for species requiring extensive blocks of suitable habitat; or - habitat for Regional rare or endangered species; or - areas adjacent to ESA's identified as 'Unacceptable'	- distinctive and unusual landform within the Region, Ontario or Canada; or - area plant or animal communities are of unusually high quality within Region, Ontario or Canada; or - areas particularly suitable for scientific research and conservation education; or - areas of high aesthetic value in the context of surrounding landscape; or - areas of high aesthetic value in the context of surrounding landscape; or - areas adjacent to ESA's identified as 'High' impact	- areas adjacent to ESA'a identified as 'Moderate'

TABLE 2 - FINAL EVALUATION FACTORS FOR THE GENERAL OVERVIEW ANALYSIS

FACTORS	LEVELS OF IMPACT			
	Unacceptable	High	Moderate	Low
LAND USE FACTORS Compatibility with Existing and Planned Use	Within or adjacent to existing built-up urban areas and/or existing Hamlets or Rural Clusters	Within or adjacent to planned Urban Areas and planned Rural Clusters	Within 1.6 km of these designated areas	More than 1.6 km from these designated areas
TRANSPORTATION FACTORS Traffic Service & Safety	A) areas not adequately served by provincial highways; B) areas not adequately served by primary or secondary arterials; C) local roads are unsuitable for upgrading D) haulage vehicles would disrupt local traffic E) potential pedestrian-vehicle conflicts exist	Factors A, B, D and E or A, B, and D	Factor A	None of the Factors
SOCIAL FACTORS Population Density	400 persons/square kilometre or greater	200-399 persons/square kilometre	100-199 persons/square kilometre	Less than 100 persons/square kilometre
Community Services and Institutions	- locationally unique, provincial and regional serving facilities including provincial parks, conservation areas, the Bruce trail	- major, regional serving facilities characterized by large, temporary populations and/or with special siting criteria including hospitals, correctional facilities, airfields, colleges, high schools	- regional and community serving facilities with generally lower temporary populations including elementary schools, homes for the aged, nursing homes, major community centres - regionally significant social or cultural features including cemeteries, parkway belt, museums	- facilities with lower temporary populations and/or seasonal populations including municipally designated open space, public and private recreation facilities including golf courses, race tracks, drive-ins
ECONOMIC FACTORS Land Costs (1982 $)		Above $50,000/ha. (approx. $20,000/ac.)	$10,000-$50,000/ha (approx. $ 4,000-$20,000/ac)	Below $10,000/ha (approx. $4,500/ac
Haul costs (1982 $)		$13.00-$19.00/tonne	$8.00-$13.00/tonne	$2.00-$8.00/tonne
CULTURAL FACTORS Historical		Existence of known sites		
Archaeological Resources		Existence of known sites		

APPENDIX I

Report of Public Open House Held
July 20, 1983

ENVIRONMENTAL ASSESSMENT OF THE LANDFILL COMPONENT OF HALTON'S SOLID WASTE MANAGEMENT SYSTEM

REPORT ON THE INFORMATION CENTRE: PHASE TWO, STAGE TWO: GENERAL OVERVIEW ANALYSIS

Prepared by

INSTITUTE OF ENVIRONMENTAL RESEARCH INC.
5441 Yonge Street, Suite 201
Willowdale, Ontario M2N 5S1

August, 1983

ENVIRONMENTAL ASSESSMENT OF THE LANDFILL COMPONENT OF HALTON'S SOLID WASTE MANAGEMENT PROGRAM

REPORT ON PHASE TWO, STAGE TWO INFORMATION CENTRE

1. Introduction

An Information Centre was held on July 20, 1983 at the Halton Regional Administration Building to review the Draft Evaluation Factors for the General Overview Analysis. Information was available for public review and comment on the screening process that was proposed to identify potential areas within the Halton Region for landfilling and the proposed evaluation factors to be used in this screening process.

Members of the study team were available at the Information Centre to meet with the public between 5 p.m. and 10 p.m. The Information Centre was advertised in local newspapers and letters of invitation were sent to the study's mailing list. Individuals attending the Information Centre were provided with background information summarizing the study team's approach to the General Overview Analysis stage of the site selection process. (This material is reproduced in Appendix One.) Copies of the study team's report entitled Draft Evaluation Factors: Phase 2 Stage 2A, General Overview Analysis were also available. Anyone interested in receiving further information on the study or having comments on the material presented at the Information Centre were asked to return a Comment Sheet. (Appendix Two) The public were invited to comment generally on the proposed evaluation factors and screening process. The Comment Sheets also addressed specific questions designed to solicit public input on the evaluation factors used at this stage of the study and the priorities assigned to these factors.

.....2

Ten individuals excluding representatives of the Regional Municipality of Halton signed the registration book indicating their attendance at the Information Centre. A comment Sheet was returned by one individual, one individual asked to be added to the study's mailing list.

2. Summary of Public Input

The input from the single Comment Sheet returned at the Information Centre can be summarized as follows:

- the Overview Analysis procedure appears well founded and thorough
- the order of priorities as outlined in Panel 6 is acceptable
- every consideration should be given to reducing the landfill component to a minimum by resource recovery and energy extration.

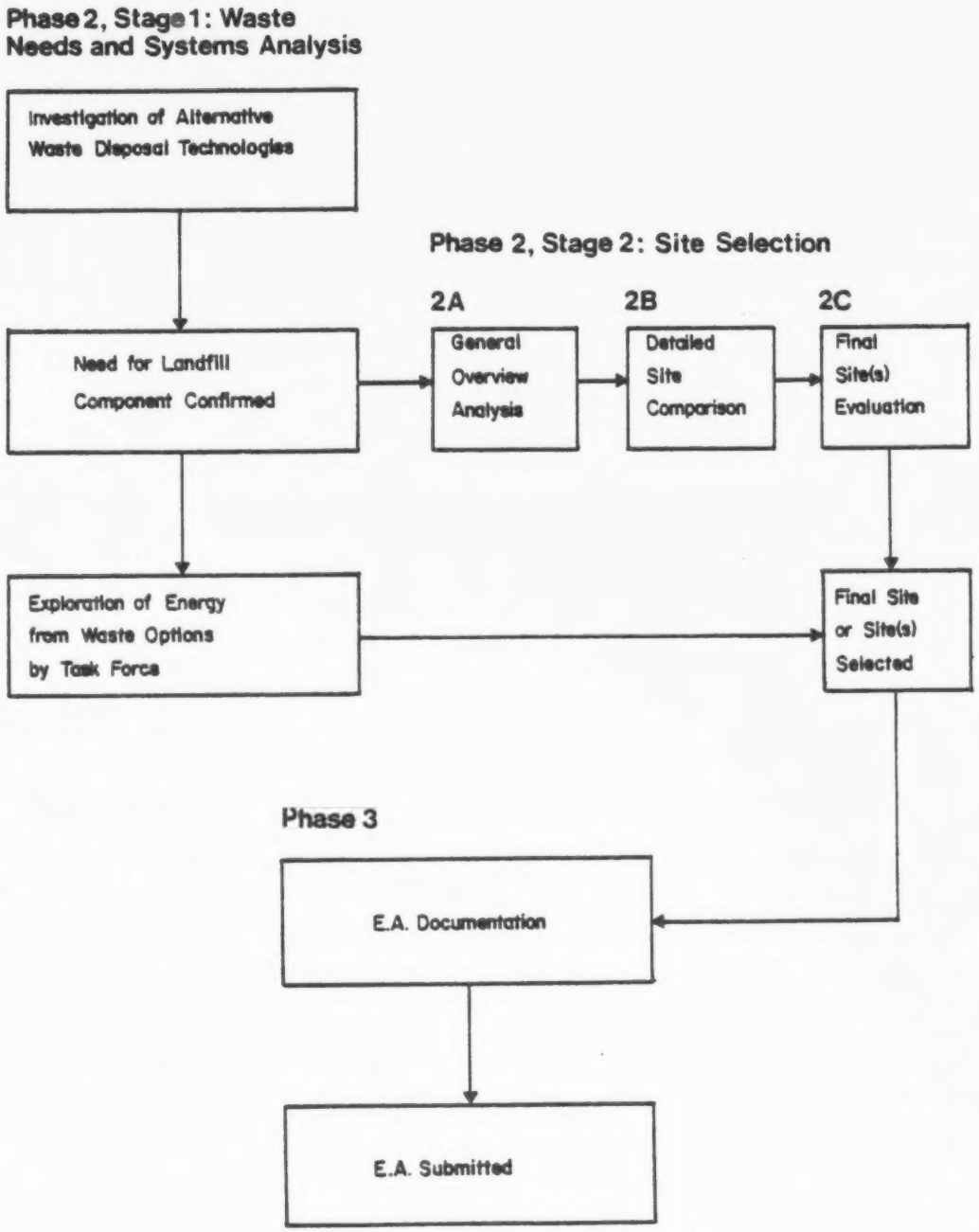
3. Request for Further Involvement

The following individual asked to be added to the study's mailing list.

Mr. R.J. Pahey
827 Shadeland Avenue
Burlington, Ontario
L7T 2M2

HALTON ENVIRONMENTAL ASSESSMENT OF THE LANDFILL COMPONENT

STUDY PROCESS



WHERE DOES THE GENERAL OVERVIEW ANALYSIS FIT INTO THE STUDY PROCESS?

STAGE	Phase 2, Stage 1 Waste Needs and Systems Analysis	Phase 2, Stage 2 Site Selection for the Landfill Component		
		2A. General Overview Analysis	2B. Detailed Site(s) Comparison	2C. Final Site(s) Evaluation
PURPOSE	• to establish the need for a landfill component in Halton's solid waste management system based on a review of projected waste quantities over the next 20 years and possible future alternative technologies for solid waste disposal	• to screen the entire Region of Halton to identify areas that are potentially acceptable for landfilling	• to identify specific sites within the potential landfill areas outlined in the General Overview Analysis • to compare the advantages and disadvantages of each site for a landfill operation	• to recommend a preferred site or sites for the landfill component
OUTPUT	• the landfill component should be a maximum of 7.2 million cubic yards based on an Energy from Waste component as the primary method of waste disposal • the Region will further investigate the feasibility of an Energy from Waste operation	• a number of potential areas within the Region where landfilling could be established	• identified sites • detailed evaluation of the sites	• recommended landfill site or sites
TIMETABLE	January to June 1983	June to September 1983	October 1983 to February 1984	March 1984 to July 1984

WHAT IS THE PURPOSE OF THE GENERAL OVERVIEW ANALYSIS?

The General Overview Analysis is the first step in the site selection process. Its purpose is to screen the entire Region of Halton to identify broad areas which appear acceptable for a landfill from a physical, economic, social and cultural standpoint.

This will involve identifying a limited number of evaluation factors that can be applied at the Regional scale to identify areas that appear suitable for landfilling and areas that are unacceptable. The General Overview Analysis will identify potential landfill areas that are manageable for more detailed study. It is important to recognize that the General Overview Analysis is only the first step in the site selection process and that more detailed analysis will occur at each subsequent step leading up to the final selection of a landfill site or sites.

WHAT TYPES OF FACTORS WILL BE USED IN THE SCREENING PROCESS?

The following categories of evaluation factors are proposed at this level in the screening process:

PHYSICAL FACTORS:
- Soils/Geology
- Topography and Landforms
- Hydrology
- Hydrogeology
- Biophysical
- Land Use
- Transportation

ECONOMIC FACTORS:
- Haul Costs
- Land Costs

SOCIAL FACTORS:
- Population Density
- Regional Serving Community Services and Institutions

CULTURAL FACTORS:
- Historical
- Archaeological
- Cultural Landscape

The approach to the General Overview Analysis differs from previous site selection studies in Halton in that a broader range of factors, including economic, social and cultural factors, will be considered when identifying potential landfill areas.

The proposed evaluation factors that would be used at the initial site screening level are not as detailed as the factors that will be used at later stages to compare sites. More detailed factors would be added at subsequent stages in the site selection process.

The proposed evaluation factors have been defined to distinguish between areas where landfilling would be unacceptable, and where landfilling would have a high, moderate and low impact.

The proposed evaluation factors are outlined on Panel 5.

PROPOSED EVALUATION FACTORS FOR THE GENERAL OVERVIEW ANALYSIS

FACTORS	LEVEL OF IMPACT			
	Unacceptable	High	Moderate	Low
PHYSICAL FACTORS				
Soil Type		Glacial Outwash (sand and gravel)	Pleistocene Geologic Complexes	Till and Clay Plains
Overburden Thickness	0-5 metres	5-10 metres	10-15 metres	15+ metres
Agricultural Lands		Class 1, 2, 3	Class 4 & 5	Class 6 & 7
Slope	Greater than 20%		0-20%	
Distance from Major Watercourse	Less than 100 metres		More than 100 metres	
Wetlands/ Floodplains		Area greater than 50 hectares	Less than 50 hectares	Non-wetlands
Infiltration		Greater than 25 centimetres	15-25 centimetres	Less than 15 centimetres
Buried Valley-Aquifer Complexes	Buried valley-Aquifer Complexes			
BIOPHYSICAL FACTORS				
Environmentally Sensitive Areas	- ecological function of area contributes significantly to maintenance of natural system beyond its boundaries by serving as a water storage, recharge or discharge area; or - habitat for Provincial or National rare or endangered species	- habitat with limited representation in the Region, Ontario or Canada or a small remnant of particular habitats that have virtually disappeared within the Region; or - area has an unusually high diversity of biological communities; or - large areas affording habitats for species requiring extensive blocks of suitable habitat; or - habitat for Regional rare or endangered species	- distinctive and unusual landform within the Region, Ontario or Canada; or - area plant or animal communities are of unusually high quality within Region, Ontario or Canada; or - areas particularly suitable for scientific research and conservation education; or - areas of high aesthetic value in the context of surrounding landscape	- areas adjacent to the designated areas

PROPOSED EVALUATION FACTORS FOR THE GENERAL OVERVIEW ANALYSIS

FACTORS	LEVEL OF IMPACT			
	Unacceptable	High	Moderate	Low
LAND USE FACTORS				
Compatibility with Existing and Planned Uses	Within designated urban areas, development areas and hamlets	Adjacent to same designated areas	Within 1.6 km. of same designated areas	Over 3.2 km. from same designated areas
TRANSPORTATION FACTORS				
Traffic Service and Safety	A) areas not adequately served by provincial highways; B) areas not adequately served by primary or secondary arterials; C) local roads are unsuitable for upgrading D) haulage vehicles would disrupt local traffic E) potential pedestrian-vehicle conflicts exist	Factors A,B,D and E or A,B, and D	Factor A	None of the Factors
SOCIAL FACTORS				
Population Density	400 persons/square kilometre or greater	200-399 persons/square kilometre	100-199 persons/ square kilometre	Less than 100 persons/square kilometre
Community Services and Institutions	- locationally unique, provincial and regional serving facilities including provincial parks, conservation areas, the Bruce Trail	- major, regional serving facilities characterized by large, temporary populations and/or with special siting criteria including hospitals, correctional facilities, airfields, colleges, high schools	- regional and community serving facilities with generally lower temporary populations including elementary schools, homes for the aged, nursing homes, major community centres - regionally significant social or cultural features including cemeteries, parkway belt, museums	- facilities with lower temporary populations and/or seasonal populations including municipally designated open space, public and private recreation facilities including golf courses, race tracks drive-ins

PROPOSED EVALUATION FACTORS FOR THE GENERAL OVERVIEW ANALYSIS

FACTORS	LEVEL OF IMPACT			
	Unacceptable	High	Moderate	Low
ECONOMIC FACTORS				
Land Costs (1982 Dollars)		Above $50,000/ha. (approx. $20,000/ac.)	$10,000-$50,000/ha. (approx. $ 4,000-$20,000/ac.)	Below $10,000/ha. (approx. $ 4,500/ac.)
Haul Costs (1982 Dollars)		$13.00-$19.00/tonne	$8.00-$13.00/tonne	$2.00-$8.00/tonne
CULTURAL FACTORS				
Historical		Existence of known sites		
Archaeological Resources		Existence of known sites		

HOW WILL THE REGION BE SCREENED FOR ACCEPTABLE LANDFILL AREAS?

The proposed evaluation factors will be used to identify areas within the Region where a landfill operation would be unacceptable and where it would have high, moderate and low impact. The following procedure is proposed to identify areas that appear suitable for landfilling:

- all areas where landfilling is considered unacceptable would be removed from consideration;
- areas where all factors indicate that landfilling would have a low impact would be selected as potential landfill areas;
- if few areas of low impact are identified, it would be necessary to select areas where some of the factors suggest landfilling would have firstly, a moderate impact or secondly, a high impact.

If it is necessary to consider areas where some of the proposed evaluation factors suggest a landfill will have a moderate or high impact, a decision will have to be made on which factors a moderate or high impact is more acceptable. The following guidelines will be used to make this decision.

First Priority	Avoid disturbance or degredation of the natural environment, including landforms, natural habitats, major aquifers, preservation and conservation areas
Second Priority	Maintain and preserve natural resource areas in Halton, where possible, such as agricultural lands, recreation areas, aggregate resource areas, and forestry areas
Third Priority	Minimize the increase in costs to Halton residents for the provision of solid waste management services, including collection, distribution and disposal

We would appreciate your comments on these priorities. Please complete the appropriate section of your Comment Sheet.

WOULD ANY OTHER FACTORS BE CONSIDERED IN THE SELECTION OF POTENTIAL LANDFILL AREAS?

It is our expectation that the proposed evaluation factors identified on Panel 5 will be sufficient to identify potential areas for landfill at the General Overview Analysis stage. However, if necessary, a number of supplementary factors might be considered depending upon the specific areas that are identified once the Overview Analysis is underway. These supplementary factors would only be used at this stage if it was necessary to select preferred areas from a large number of low impact areas or if they could act as mitigating measures in some of the areas to lessen the anticipated impact (for example, in areas where engineering could potentially lessen the impact).

The types of supplementary factors that might be considered include:

- areas currently serviced with municipal water or expected to be serviced in the 20 year planning period;
- existing unused quarries;
- the cost and complexity of engineering the area(s).

WHAT HAPPENS NEXT?

Following a review of the public's comments on the screening factors and process, any necessary revisions will be made and the General Overview Analysis will be undertaken.

The results of this analysis, including the identification of potential landfill areas will be reviewed with the public at an Information Centre planned for September. The identification of specific sites within these areas and the detailed assessment of these sites leading to a recommended site or sites for Halton's landfill component will begin in the Fall. The public will have an opportunity to review the study process for the detailed assessment of sites in the Fall.

ENVIRONMENTAL ASSESSMENT OF THE LANDFILL COMPONENT OF HALTON'S SOLID WASTE MANAGEMENT SYSTEM

INFORMATION CENTRE
JULY 20, 1983

THE GENERAL OVERVIEW ANALYSIS OF THE SITE SELECTION PROCESS

INTRODUCTION

The first stage of the Environmental Assessment of the Landfill Component of Halton's Solid Waste Management System evaluated alternative methods for disposing of Halton's solid waste. It was determined that the disposal system should be resource recovery based with one component being landfill.

The consultants are now beginning the site selection process to identify potential landfill areas in Halton. The first step in the site selection process involves a General Overview Analysis where the entire Region will be screened to identify areas of Halton that appear to be environmentally, socially and economically acceptable for landfill sites.

The purpose of this Information Centre is to provide the public with an opportunity to review and comment upon:

- the screening process that is proposed to identify potential areas;
- the proposed evaluation factors that will be used in the initial screening process.

This information is available on the display panels. Members of the study team are also available to answer your questions.

Your response to the proposed screening process and proposed evaluation factors will be considered before the consultants undertake the General Overview Analysis. Please complete the attached Comment Sheet.

ENVIRONMENTAL ASSESSMENT OF THE LANDFILL COMPONENT OF HALTON'S SOLID WASTE MANAGEMENT SYSTEM

INFORMATION CENTRE: General Overview Analysis

COMMENT SHEET

If you have any general comments on the information presented this evening, please record them below. We would also appreciate your response to the questions on the reverse side of this page.

Please leave the Comment Sheet with us this evening or return it no later than July 27, 1983 to:

Mr. Paul Attack, Senior Planner
Regional Municipality of Halton
1151 Bronte Road
Oakville, Ontario L6J 6E1

Regarding Panel 5: The Proposed Evaluation Factors

1. If you have any comments on the proposed evaluation factors that have been identified and the definitions of unacceptable, high, moderate and low impacts, please list these below.

2. If you think additional factors should be considered at the General Overview Analysis stage of the site selection process, please list the additional factors you think should be considered and how you would define their level of impact.

Regarding Panel 6: The Screening Procedure

1. If you have any comments on the screening procedure, please list your comments below.

2. If you do not agree with the general statement of priorities on Panel 6, please comment below.

Regarding the Study's Mailing List

1. Are you currently on the study's mailing list?

Yes ☐ No ☐

If you would like to be on the mailing list, please list your name and address below:

Name: _____

Address: _____

APPENDIX II

Submissions on Draft Evaluation Factors from External Agencies and Interest Groups

THE REGIONAL MUNICIPALITY OF HALTON

P.O. BOX 7000
1151 BRONTE ROAD
OAKVILLE, ONTARIO L6J 6E1
416/827-2151

PLANNING AND
DEVELOPMENT
DEPARTMENT

83 07 29

RECEIVED
JUL 29 1983
WALKER WRIGHT YOUNG
ASSOCIATES LIMITED

Walker, Wright, Young Associates
15 Delisle Avenue,
Toronto, Ontario
M4V 1S8

Attention: Mr. Peter Walker

Dear Mr. Walker,

Re: Halton Landfill EA Regional Comments on Draft Evaluation Factors
File 3708.422

Please review and respond to the following comments on the Draft Evaluation Factors as part of the General Overview Analysis Work Program.

1. The method to be used for weighing and ranking the factors is not clear in the report. Perhaps it was not originally intended to explain the method but some explanation is required as an introduction. The last paragarph on page 5 touches on this but is difficult to understand.

2. The first, second and third priority items on page 5 do not relate directly to the factors. The reader cannot ascertain what priority will be given to any particular factor. This is critically important and should be clearly articulated. For example, social, economic and cultural factors are not even mentioned under priorities on page 5.

3. I understand that those areas ranked unacceptable will not be further considered. Please confirm this in the report and explain how unacceptable rankings are to be handled.

4. The overlay technique is more useful for mapping physical constraints than social or cultural constraints. Please clarify how these less easily mapped factors could be applied on an overlay map. The overlay map itself is most useful as a communications vehicle and requires a great deal of written documentation such as descriptions and assumptions to accompany the map.

5. It is not clear how "possible mitigating measures at a generic level of detail" (p. 5) will be considered. Our concern is that the conparison will be uneven if mitigation is generally considered for high impact areas and the result reduces them to a moderate impact category. Mitigation is, for the most part, a site specific consideration depending on the particular details. It also may be considered under the engineerability section later in the report and this may be confusing or a double-counting problem.

6. Agricultural impact is more than soil capability and should include consideration for farm viability and impact on the neighbouring farm community. Note the Regional Plan designates Prime Agricultural Land as Class 1 to 4.

7. The significance of 50 hectares as a cut-off figure between high and moderate impact requires some justification. Many wetlands considered Regionally significant in Halton are less than 50 hectares. This may be more of a Provincial or National criteria.

8. There is a close relationship between infiltration and attenuation since the soil characteristics could be very similar. Could this become a double-counting problem or lead to confusion in the weighting and analysis?

9. The Type and Distribution of Aquifers section does not provide any information as to how aquifers may be ranked into high, medium and low. A uniform approach to all factors would improve understandability and acceptance of the method.

10. Please clarify how the three supplementary factors are to be incorporated into the analysis.

11. There are currently only thirty-seven ESA's approved in the Regional Plan (ESA #11 was deleted by Ministerial modification). The nine Regional selection criteria have never previously been ranked and the Planning Department's view is that ranking is inappropriate. The initial selection and documentation did not involve ranking and in fact only one selection criteria needs to be met to allow designation in the Regional Official Plan. Ranking of the criteria appears quite subjective and in our view is not supported by the documentation provided in the ESA study. I am not sure how Provincial or national status relates to criterion two or six on page 14, but we are of the opinion that all the ESA's are of at least of Regional environmental significance and this should be sufficient to warrant protection. The ESA policy stipulates that development in

or adjacent to ESA's can only be judged acceptable following the submission of a detailed Environmental Impact Assessment. To judge development in or adjacent to an ESA as only a moderate or low impact without completing an EIA is inappropriate. All development proposals reviewed by the Region are required to include an EIA if in or adjacent to an ESA before determination of the level of impact. Landfill sites should be given a similar treatment.

12. The land use factor should also consider Rural Clusters as identified in Regional Official Plan Amemdment No. 5. In addition, extensive areas of strip development could be given some consideration and this may overlap with the population density factor.

13. There is a contradiction on page 17 under community services where it states that important scenic features are to be avoided. The problem is that many of the most scenic features are Environmentally Sensitive Areas and the aesthetic criteria for ESA's in the previous section on Biophysical is only rated as moderate impact. Scenery is subjective, therefore the factor will be difficult to weigh and in the document no ranking is mentioned.

14. The land cost factor is closely related to distance to urban areas and transportation considerations. There may be an overlap or double-counting with other factors.

15. The usefulness of D.3 Cultural Landscape is unclear as all the elements mentioned appear to be previously noted under other categories.

16. I have attached comments from the Public Works Department and Halton's Ecological and Environmental Advisory Committee for your consideration and response.

Yours truly,

for R. Mohammed,
Director of Planning and Development

PA/kk
c.c. D. Perlin
G. Woodburn
D. Hodgson

REGIONAL MUNICIPALITY OF HALTON

INTEROFFICE MEMORANDUM

RECEIVED
JUL 29 1983
WALKER WRIGHT YOUNG
ASSOCIATES LIMITED

TO: P. Attack,
Planning & Development

FROM: G.N. Woodburn, P.Eng.
Manager of Waste Disposal

DATE: 1983 07 28

Re: Public Works Staff Comments, Draft Evaluation Factors Phase II, Stage 2A General Overview Analysis by Walker Wright Young Associates Limited

We have reviewed the above mentioned draft report and have the following comments, observations and questions.

Page 5

"Unacceptable impact" seems too restrictive for the overview stage. Perhaps we should go with "HIGH", "MODERATE" and "LOW" impacts for Stage 2A in order that a decision on the relative acceptability of sites can be made at a later stage.

Page 5

With respect to a "first priority item", when constructing a landfill you cannot avoid some disturbance or disruption of the natural environment.

Page 7

In the section dealing with Physical Factors it is not clear what role "quaternary geology" plays.

The first sub heading for Section A deals for the most part with attenuation capability and therefore shouldn't the sub heading in fact be Attenuation Capability instead of Soil Type, and perhaps the underlined heading at the bottom of Page 7 could be Soil Type instead of Attenuation Capability.

Previous studies did in fact consider low agricultural capability lands.

What is meant by explicit terms in the case of quarries? And is natural attenuation of silt satisfactory for landfilling?

...2...

Page 8

In the second paragraph it could be noted that overburden is removed to make room to place refuse as well as obtain cover material.

Pages 7, 8 ,9

"impacts" mean different things, i.e., in the case of Agricultural Capability it means impact from landfilling on agriculture. In the case of Slope, it is the impact of the slope on the landfilling. Someone not familiar with landfilling could misinterpret the impacts. Is there some way the impact rating can be made consistent?

Page 9

We would like clarification of what is meant by "slope face" with respect to the Niagara Escarpment.

With respect to Slope, landfilling has been done successfully in areas with slopes of more than 20%, and sides of landfills are finished off at as much as 25% or more.

Page 10

How do you define a major watercourse?

Our Oakville sanitary landfill site is less than 100 m from a Creek in some places and yet it was given approval by the M.O.E. and was operated satisfactorily.

Page 11

What do the infiltration figures mean? It is not clear whether it is rate of filtration or quantity of water infiltrating the soil in a given period of time, or penetration.

Page 13

The statement that operating quarries would be judged unsuitable for sanitary landfill requires clarification. National Sewer Pipe are proposing a landfill in an area that has a license for quarrying.

...3...

Page 15

Clarification of "compatability with existing and planned land use" is required. Various landfills in Halton in the past have been operated in development areas with no apparent adverse affect. Some of them are now parks. The ready availability of sanitary sewers can be used to advantage to drain off and treat leachate.

Page 16

With respect to the unacceptable impact,"area" conditions may prevail now but what is to prevent the municipality from constructing a new road to gain access to a landfill, particularly in rural area?

Page 17

How do you define or determine what an important scenic feature is? This is very subjective. Scenery, to a large degree, is in the beholder's eye.

What are "potential" impacts "such areas"?

Pages 18, 19

With respect to both land and haul costs, we find it difficult to understand the "unacceptable" impact. It should be clarified.

References to another document, in this case Phase 2, Stage 1, Section 6 should be avoided. The text in this report should be self explanatory without referring to other reports.

It is not clear why land and haul costs only are being considered in Stage 2A. Why aren't potential site development and operation costs included as well?

Haul costs, to have any real meaning, are more site specific than general. We are looking at relatively large areas in the general overview stage and haul costs can change significantly depending where you are in the area.

Page 20

What are "potential" historical sites?

...4...

The statement at the end of the second paragraph under historical, "the factor is not an absolute constraint ..." could hold true for most of the other factors as well.

GENERAL OBSERVATION

The general overview screening process that is being proposed appears to be overly stringent. "Unacceptable impact" bears with it the connotation of final rejection. It could be difficult later to circle back and give further consideration to areas that have unacceptable impacts in the event that the general overview process results in few if any acceptable areas.

DJC:nw

RECEIVED
WALKER WRIGHT YOUNG
ASSOCIATES LIMITED

Ecological and Environmental Advisory Committee
Subcommittee Comments on
Halton Landfill Component Environmental Assessment

83 07 26

This report responds to the invitation to comment on the Draft Evaluation Factors report prepared by Walker, Wright, Young Associates Ltd. documenting the process proposed for evaluating the merits of alternative sites that would host the landfill component of the Halton Region Solid Waste Management System. Due to time constraints, EEAC comments are submitted based on limited discussion with sub-committee members. We trust however that the following comments reflect general EEAC philosophy.

Much of the effort to date in carrying out the Work Program has simply paved the way for addressing the issue now before us - that is, identifying potential landfill sites within the region, and through an objective, quantitative screening process, select a site for disposal of Halton Region's wastes judged suitable for landfill disposal.

The screening process selected by Walker, Wright Young Associates proposes a series of weighted evaluation factors that would permit, through matrix display, a summing process (and thus a ranking of priority sites) that is as objective and quantitative as possible within the political atmosphere that surrounds the entire issue. It is important then that the selection process be and be seen to be impartial, objective and thus quantifiable. The following comments address this aim.

The screening process proposed includes evaluation of four categorical factors: Physical, Social, Economic and Cultural. Four impact levels are proposed ranging from 1 - Unacceptable to 4 - low impact.

In our view the site selection process would be better served by a system that first screened out unacceptable sites, then weighed in a quantifiable manner the merits of competing "acceptable" sites. Thus, sites within flood plains, sites lacking suitable set-backs from developed residential areas, sites obviously lacking suitable cover, sites over aquifer complexes, etc. would be avoided. Sites that are prima facie unacceptable should not be included in the final weighed evalutation list. Only impacts that are acceptable can be weighed and compared against others, thus it is suggested that the evaluation system only include factors ranging from low to high impact and exclude those facters judged to be "unacceptable".

The following comments address specific evaluation factors:

1. Under PHYSICAL FACTORS (Pg. 7) for consistency the first subset should be headed Attenuation Capability not Soil Type and the third sub-heading should read Agricultural Capability not Agricultural Lands. Under Overburden Thickness, the impact cannot be weighed on the basis of depth of overburden alone but rather in combination with attentuation capability to establish an impact ranking. It will be difficult for the lay public to understand the impact rating statement for overburden thickness 0-5 m unacceptable impact "without engineering". Can any landfill site be developed without engineering? Perhaps a comments as to the particular additional engineering controls required for thin overburden sites would be helpful.

2. Under Topography and Landforms slope is evaluated on a yes or no basis. This is not a weighing process but a qualification process. This section should provide a range of impacts (low to high) for various slopes within the acceptable 0-20% range.

3. Similar comments apply to page 10 - Distance from major Watercourse. One would not select sites less than 100 meters from a major watercourse so why weigh it?

   For distances over 100 meters the degree of impact will not be based so much on distance but rather on soil type, bedrock profile, surface contours etc. Distance should only be applied to judge basic acceptability, not to judge degree of acceptability.

4. Under Wetlands/Flood Plains, would any selection process nominate a flood plain for a landfill site? The evaluation factor table on page 10 is simply not realistic and should be deleted. We question the low to moderate impact rating for wetlands less than 50 hectares. Most wetlands within the region fall into this size category. Wetland's importance to the particular watershed, not size, should be evaluated to establish impact.

5. Under Groundwater, the percolation rate (expressed in the report as infiltration) should be based as a rate over time within a text designed for the lay reader (although the short form expression is widely used in technical publications).

6. Under Biophysical (pg. 14) an impact table suggests low impact for sites adjacent to ESA's. Impact cannot be judged from a physical proximity basis but must be established (as required under regional plan policies) by conducting an environmental impact assessment!

Further, we would question the "moderate" rating for ESA's under criteria selection 1, 3, 8 and 9. Again a much more detailed review is required in order to predict impact.

7. The report suggests (pg. 17) that areas of high urban population density will be generally avoided (in selecting landfill sites). It should be made clear that sites selected will avoid developed residential areas and a specified "cordon sanitaire" or set-back would be established as a minimum requirement between a site and the closest permanent residence.

8. While the concept of rating the economic impact of land values (pg. 18) is understood, the statements associated with the four levels of impact are confusing. Is it not true that land costs and haul costs must be integrated in any evaluation? The operative word is cost not land cost or haulage cost.

   If this notion is accepted then the unacceptable impact/land cost ratings are inconsistent. Similar comments apply to the ratings under Haul Costs.

Summary

In summary, we support a selection process that provides a quantitative objective weighing of alternative prospective landfill sites but suggest a pre-qualification screening to separate "unacceptable" from other sites that can be weighed as to their degree of acceptability.

Respectfully submitted,

R. Edmondson,
W. Eedy,
N. Hester,
W.C. Ferguson,
Chairman, EEAC Subcommittee

WCF/kk

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ASSOCIATES

July 26, 1983.

Mr. R. Mohammed,
Director of Planning and Development,
The Regional Municipality of Halton,
P.O. Box 7000,
1151 Bronte Road,
Oakville, Ontario.
L6J 6E1

Dear Mr. Mohammed:

Re: Halton EA General Overview Analysis
Draft Evaluation Factors
EA File No. 1-82-0006-000

The draft evaluation factors have been reviewed by the Branch and it is our opinion that they are acceptable in terms of the definition of environment and the content requirements for an environmental assessment provided in the EA Act.

We concur with the direction given by the Planning and Public Works Committee respecting the need for co-ordination between the landfill component planning effort and the energy from waste component planning effort. As you are aware, we are liaising with Dave Birkett and his EFW study team. We are in agreement with the proposed schedule for comparing the results of the EFW effort with the landfill EA effort. This schedule should ensure that the landfill EA planning remains as current as can reasonably be expected. It is the case that the EFW effort is about a year behind the landfill planning effort. However, the schedule for the EFW study is such that a definitive position on the role that energy from waste can play in the total waste picture will be provided for input to the landfill planning effort just prior to the drafting of the landfill environmental assessment. Certainly the fact that the two planning efforts are not in exact step at this point in time creates some element of risk however the Region's unique situation is unavoidable and the risk must be accepted.

We have the following specific comments concerning the evaluation factors:

1. Criteria A.1 - Agricultural Capability:

   - High impact should include specialty crops such as orchards as well as Class 1, 2 and 3 agricultural lands.

2. Criteria A.2 - Topography and Land Forms, Niagara Escarpment:

   - It would seem reasonable that a minimum distance for buffer from the toe of the slope face of the Niagara Escarpment to the site be established such as that distance (100 meters), given for major water courses.

3. Criteria A.6 - Bio-physical Environmentally Sensitive Areas:

   - It is suggested that high impact include E.S.A. selected for one or more of Criteria 4, 5, 7 or 6 at the Regional status level and adjacent to E.S.A. selected for Regional Criteria 2 or 6 (provincial or national status).

   - Similarly, moderate impact should include all other E.S.A.'s and adjacent to E.S.A. selected for one or more of Criteria 4, 5, 7 or 6 at the Regional status level.

4. Criteria A.7 - Land Use:

   - Perhaps some examples of the provincial, regional and local plans affecting the siting of waste disposal facilities in Halton could be provided. For example, it is assumed that the efforts of the Ontario Waste Management Corporation are one of the provincial plans to be consulted respecting this criteria. Other Provincial plans would include MTC highway development. Regional plans would include sewage service development, etc.

5. Criteria A.5 - Supplementary Factors:

- Shouldn't sewer service areas be a supplementary factor similar to water serviced areas in that proximity to sewage servicing will be considered in association with the engineerability of general areas.

Yours truly,

Wayne Smith

for Paul H. Rennick,
Director,
Environmental Assessment Branch.

MGP/ma

CC. STEVE ROWE,
WALKER, WRIGHT, YOUNG ASSOC. LTD.

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Environmental Approvals and
Project Engineering Branch

July 29, 1983

Mr. R. Mohammed,
Director of Planning and Development,
Regional Municipality of Halton,
P.O. Box 7000,
1151 Bronte Road,
Oakville, Ontario.
L6J 6E1

Dear Mr. Mohammed:

Re: Halton's Environmental Assessment Phase 2, Stage 2A
General Overview Analysis, Draft Evaluation Factors

I am writing in response to your letter of July 11, 1983 concerning the general overview analysis draft evaluation factors for the Halton environmental assessment.

As a general comment we consider that the general public would find the document difficult to read and understand.

We think that the General Overview Analysis would probably be better handled with a Kepner-Tregoe approach in which certain factors are rated as GO/NOGO and other factors are weighted as to importance and then given a weighted rating.

Our specific comments are as follows:

Page	Comment
2.	We would like to know what is meant by the first sentance in the last paragraph "It should be noted that this stage will be based on common elements for the selection of potential landfilling areas, which do not change regardless of the preferred waste management system".
4.	We do not understand the second paragraph under suitable areas for landfilling especially the statement that the significance of physical factors will be reduced in subsequent stages. It would appear that avoiding areas with major aquifers, significant ecological habitats and prominent landforms would remove any sites in these areas from consideration. We therefore would like to know if the paragraph means that physical factors will be given a different weighting at the site comparison and final site evaluation stages.

5. Under the prioritizing system do you plan to give numerical weights to the three priority items which you identify?

8. Under Agricultural Lands and the specific evaluation factor Agricultural Capability, we found that the explanation of the impact evaluation was not clear.

12. You do not explain how a potential waste disposal site which could leach into a major municipal supply aquifer would be rated. If this were to be evaluated using the Kepner-Tregoe approach, would such a site be rated as NOGO?

19. We do not feel that haul costs should come into the evaluation in the General Overview Analysis since they have little to do with the three part purpose set out on page 4 of the document. If you include haul costs, operating costs should be included as well since these will also vary from site to site.

We would appreciate a written response to our concerns.

If you have any questions concerning this, please call Mr. G. Donnelly of my staff at 965-6421.

Yours truly,

P. S. Isles, Supervisor
Waste Sites & Systems Approvals Unit
Environmental Approvals Section

GD/dms
c.c. P. Walker, Walker Wright Young Associates Ltd.,
M. Pratt
A. Giffen, Attn: G. McCarty

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Niagara
Escarpment
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PLANNING & DEVELOPMENT
REG. MUN. OF HALTON

July 20, 1983.

Mr. R. Mohammed
Director of Planning and Development
Regional Municipality of Halton
P.O. Box 7000
1151 Bronte Road
Oakville, Ontario
L6J 6E1

Attention Paul Attack.

Re: Halton Environmental Assessment Phase 2, Stage 2A,
General Overview Analysis of Draft Evaluation Factors
File: 3708-422

Dear Mr. Attack:

The draft evaluation factors have been reviewed by Commission staff and recommendations will be presented to the Niagara Escarpment Commission at its next meeting. Unfortunately, the deadline for comments preceeds that meeting date. Therefore, I am sending staff comments. When the Commission has dealt with the matter, a formal comment will be made.

Staff has the following comments to make on the draft evaluation factors:

1. Agricultural lands:
Agricultural capability maps form the basis of this analysis. In addition, the agricultural use of land should be taken into consideration. This can be measured by the active use of the land for crops, capital investment in buildings and equipment, and employment in agriculture.

2. Landforms
i) Niagara Escarpment: Use of the Escarpment Natural and Protection Area designations of the Final Proposed Plan for the Niagara Escarpment will ensure that the slope and related natural systems are adequately dealt with. These designations should be used when dealing with the Escarpment.

.../2

3. Biophysical

i) Environmental Sensitive Areas: Areas of Natural and Scientific Interest (Life and Earth Science) as identified by the Ministry of Natural Resources should either be included in the analysis of Sensitive Areas or dealt with separately.

4. Land Use: Agriculture cannot be dealt with entirely as a physical factor. An agricultural community is required within which capitol and social resources have been and are invested in the land. It is suggested that areas of committed agricultural use should be ranked as either areas of unacceptable or high impact.

an ephemeral commodity in many senses.

Yours very truly,

Lorna Aitken

for/ C. A. Louis
Manager
Plan Preparation

GMcK/

COMMENTS OF THE TREMAINE-BRITANNIA CITIZENS GROUP RE "PHASE 2, STAGE 2A HALTON ENVIRONMENTAL ASSESSMENT, LANDFILL COMPONENT, DRAFT VALUATION FACTORS, TRANSMITTED BY LETTER DATED JULY 11, 1983 RECEIVED JULY 15, 1983, COMMENTS REQUESTED BY JULY 27, 1983

1. The deadline specified do not allow us to provide a detailed critique of this document.

2. We find an extreme bias present in the factors postulated, particularly with regard to item A.7, pages 14-15, insofar as these factors stipulate that sites within an urban area are to be virtually ruled out. We find that this is an improper and extreme bias for the following reasons:

   (a) sewage treatment plants, pits and quarries, rendering and other supposedly "obnoxious" industries and activities are allowed within urban areas. Why not therefore something termed a "sanitary" landfill?

   (b) if there is to be any possibility whatever to collect leachate and treat it, then the only logical place for such a facility is immediately in the area of a sewage treatment plant or in a location where the leachate may be discharged into an existing sanitary sewer line. The criteria postulated would prevent this;

   (c) this orientation towards rural areas means that sanitary landfill cannot be in an industrial area adjacent to a waste recovery or waste use facility, such as one producing RDF or steam to be used in adjacent industrial processes;

   (d) this approach ignores the need to look at sites in urban areas that are blights on the landscape and which may through the rehabilitation that landfill designers are so proud to postulate, may become beauty spots or recreational facilities rather than the present blights on the landscape.

3. The other basic problem with this document is that it assumes that physical factors of soil safety are of prime importance. It assumes that attenuation capability of till and clay plains is of prime importance and therefore this would orient any site into rural areas where such soils may be found in large quantities.

   This type of misguided orientation would prevent any site from being considered such as "Site A", an area crying out for further landfill as it is between an existing and a closed-out landfill, an area that is in need or rehabilitation and which is on sewers and which is in an urban area.

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4. It is obvious that no attention whatsoever has been given to comments made by my clients directly or through this office in writing with regard to the factors which really ought to be considered in selecting landfill locations, nor indeed has any attention been paid to the engineering evidence given by the Region's consultants previously to the effect that any landfill site should be designed to collect leachate and provide for its treatment. The implications of these facts are quite clear; any site will need engineering and leachate collection/treatment. Location of such sites in urban areas to be connected to sanitary sewer systems and the rehabilitation of blighted areas by the land use that a "sanitary" landfill can produce once completed is a fundamental factor to be considered for identifying areas of Halton suitable for landfill.

POOR

QUALITY

ORIGINAL